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Several intensive, one-day workshops have been conducted to convince medical faculty members of the effectiveness of programed instruction texts and to acquaint them with techniques for writing such texts. Earlier studies had demonstrated, through comparison of attitude and performance test results from program-instructed and control-group medical students, that programed texts are more effective than conventional methods in teaching clinical patient management. The strategy of the workshops involved placing professional, teaching physicians in the role of students learning through the use of programed materials, with the expectation that they would be better prepared to develop programed materials with the learners' problems in mind. It was especially important to show that programed instruction courses should have realistically limited objectives and that medical students can be quite adept at writing and evaluating such materials. Those workshop participants who wanted more experience in writing programed texts were invited to spend a full week doing so at the Medical College of Georgia. Appendices include, among other items, lists of workshop dates and participants, complete transcripts of questionnaire responses for two workshops, and the full 124-page course workbook "Programed Instruction in Teaching Patient Management." (RM)

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FINAL REPORT

Contract No. OEC2-6-051145-1784

Demonstration of Clinical Programming Methods and Dissemination of Results of Self-Instructional Clinical Problem-Solving Project

January 1969

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

1/9/69/ghp

Final Report

Contract No. OEC2-6-051145-1784

Demonstration of Clinical Programming Methods and Dissemination of Results of Self-Instructional Clinical Problem-Solving Project

Preston Lea Wilds, M.D. and Virginia Zachert, Ph.D.

Medical College of Georgia

Augusta, Georgia

January 1969

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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I. SUMMARY

1. A 24-hour course has been developed that effectively changes the expressed attitudes and actions of educators of professional personnel in the use of programmed materials for teaching patient management.

2. The course has been shown to be most valuable in providing a challenge for professionals who educate professionals. They are placed in the role of learners and are given techniques to make the learner's role less painful.

3. The original plan for the development of a correspondance course to change attitudes and teach self-instructional programming was perhaps over-ambitious. Complete concentration without distractions for a 24-hour period seems necessary for the attitudenal changes to take place. So far it has been found impossible to obtain such concentration except in group-sponsored, retreat settings with autocratic session leaders.

4. The persons attending the sessions almost without exception have completed this learning or "conversion" experience with highly positive attitudes and with changed behaviors.

5. The changed attitudes and behaviors have been documented by subsequent participation at the five-day sessions held at the Medical College of Georgia, consisting of approximately 70 hours of effort. During these sessions, materials have been prepared and edited, and have been evaluated by learners from the appropriate population, then revised and rewritten.

   Another aspect of change has been the active participation of each person in curriculum change on his own campus. Many have sent others to attend later conferences or five-day work sessions. Still others have organized programs at professional meetings and invited session leaders to participate.

6. A lasting result of the contract has been the organization and support of the Learning Materials Division by the Medical College of Georgia.

II. BACKGROUND

The ability to request and complete this contract is a direct result of a prior USOE Grant by the authors. Two aspects of this earlier grant follow -- first the abstract.

Purpose. In 1963 the Medical college of Georgia, under a grant from the U.S. Office of Education, undertook a study to determine whether programmed instruction could be used to improve the teaching of the management of patients with gynecologic neoplasms to junior medical students. Instruction in this clinical discipline was assumed to have a dual nature:

1. The teaching of a body of knowledge or "content," much of which is controversial or subject to rapid change.
2. The teaching of the "application" of this body of knowledge to continually changing new contexts (patients with individual problems).

Materials. Two programmed texts were prepared:

1. "Content" Text. An 830-frame linearly programmed text designed to replace conventional classroom teaching of gynecologic oncology.
2. "Application" Text. A 713-frame branching text consisting of 35 case presentations of patients with representative pelvic tumors and related conditions. The programming style used complex branches and loops, coded information-gathering frames, and remedial referrals to the "content" text in an attempt to simulate on paper the critical decision-making processes involved in working up and caring for real patients.

Criterion Measures. Four special National Board Examinations in OB-GYN Neoplasms were prepared independently for this project. The National Board Part II, Comprehensive Examinations in Obstetrics and Gynecology of previous years were also used.

Measures of the learning of "application" (patient management) were oral examinations conducted by a panel of visiting judges from neighboring medical schools, combined with special tab-item tests designed to measure specific skills in diagnosis and management of patients with gynecologic neoplasms.

Study Samples. The junior classes (96 students each) in the School of Medicine in two consecutive years were each divided into matched control and experimental groups.

In the second year of the project, cross-validation studies in five other medical schools were conducted using similarly selected groups in controlled, balanced studies.

Experimental Plan. At the Medical College of Georgia in 1963-64, and at five other medical schools in 1964-65, experimental students received the "content" programmed text as a substitute for the conventional classroom instruction given to the control groups.

At the Medical College of Georgia in 1964-65, control students received the "content" text and experimental students received both texts. No lectures were given.

Results. "Content" Testing. The linear "content" text was found in all schools to be at least the equal of and usually significantly superior to conventional instruction in its effectivenss in teaching gynecologic oncology, as measured by the National Board special examinations. When students were re-tested after a one-year interval, no significant difference in retention was demonstrated.

"Application" Testing. Experimental students who received the "applications" text of case presentations plus the "content" text scored higher on the tab-item examinations designed to measure "application" than did control students who received the "content" text alone in (1) thoroughness in collecting diagnostic information, (2) selection of appropriate diagnostic and therapeutic procedures, and they also made higher scores for overall perfromance in the oral examinations. The significance level for these differences ranged from <.1 to <.01. Experimental and control students were not significantly different in their selection of useless or contraindicated diagnostic information.

Time to Criterion Records. The superior performance of experimental students was achieved without an increase in their study time over that of control groups, and with a saving of faculty time equivalent to the time spent in the preparation and presentation of the course's conventional instruction.

Attitudes Toward Texts. The reaction of nearly all students toward both texts was strongly positive.

The second aspect of the earlier USOE grant is a summary of the contributions of that project, which follows:

Development of Programming Methods. An efficient method has been developed and demonstrated for preparing programmed instruction materials using a team of medical school faculty members and students as writers, editors, and critics. One person, specifically trained in the technology of programmed instruction, worked with the team, but did none of the actual writing and progressively reduced her importance to the team as a catalyst. These techniques have already been shown to be readily adaptable to other situations requiring the preparation of materials at the graduate level.

Effect of the "Content" Text. The linear text has proven to be an efficient teaching method highly acceptable to nearly all students who used it. The majority considered it a superior method of learning. Its effectiveness as a teaching device probably resulted from requiring the students to develop, as rapidly as possible, an active working vocabulary of gynecologic oncology. The students' early mastery of the vocabulary apparently facilitated their learning not only from the programmed text, but also from other sources, such as conventional reading, conferences, and clinical conversations with colleagues, physicians, and others.

Effect of "Composite" Text. This text has been shown to be effective in teaching the "application" of "content" knowledge to specific individual problems of patient care. This effectiveness in teaching "application" can probably be attributed to requiring the students to make responsible decisions in patient mangement. Deficiencies of knowledge and errors of judgment and skill are shown to the students by their effects on the patient's well-being. This text, with its sequenced experience in clinical decision making, probably directs the students toward a more clinical orientation, and facilitates their learning from real patients in the wards and clinics.

Effect on Curriculum. By requiring the faculty to define teaching objectives concretely, this research exposed an unreconciled conflict in the curriculum. The minimum requirements of the faculty for the course, when expressed in behavioral terms, demanded vastly more learning time from most students than could be made available without sacrificing time in other parts of the curriculum. The learning time available to the students, rather than the teaching time offered by the faculty, was found to be of paramount importance in establishing realistic objectives for a course within the medical curriculum.

Shortcomings of Evaluation Methods. The project had the benefit of the best available written and oral examinations to measure the effectiveness of its teaching program. Examinations of similar excellence are widely accepted as measures of the professional competence of candidates for licensure and certification. It was found that the tests used in the project were often inappropriate as measures of the expressed teaching objectives of the faculty and were usually inadequate as measures of essential skills in patient management specifically included in the instructional program. The lack of valid, reliable criterion measures proved to be a major handicap in the preparation, presentation, and evaluation of the teaching programs.

Development of New Tests. Significant progress has been made in the development of written tests designed to measure skills which older, more orthodox examining methods had often left unmeasured. These tests use flexible formats and have been designed to present and measure a variety of sophisticated clinical skills. Nine such tests, 23 or more pages in length, have been developed. Several are currently in use in evaluating medical students.

Texts Produced. Two programmed texts have been developed.

1. Essentials of Gynecologic Oncology -- 442 pages, 830 frames.
2. Applications of Gynecologic Oncology -- 357 pages, 713 frames -- 35 cases.

III. SCOPE OF CONTRACT

A. Original Scope of Contract

1. Work to be Accomplished During the First Year.

a. One national workshop, limited to 18 participants, will be held. The Executive Secretary of the American College of Obstetrics and Gynecology will be contacted for date and place.

b. Ten or more professional organizations will be contacted to announce this facility and service.

c. The individuals who have completed our current local program will be asked to help recruit additional trainees.

d. Not less than 75 chairmen of Departments of Obstetrics and Gynecology of the Medical School will be notified of the workshops, as these dates are firmed up. The local program, with modification and improvement, will also be announced.

e. National and Regional Professional Meetings will be attended and papers presented, if accepted.

f. Individual local programs will be conducted for not less than 20 participants at the Medical College of Georgia from 3-5 days each.

g. Questionnaires will be prepared and revised to gather data, attitudes and other information needed to revise and improve both workshops and the local program.

2. Things to be Accomplished During the Second Year.

h. All efforts of the first year will be increased and improved as experience dictates.

i. At least three National Workshops will be held in conjunction with Professional Meetings, with enrollment limited.

j. Mail-out or correspondence course materials will be developed and tried out.

k. The constantly revised and improved local program will continue to train, in depth, those who attended workshops and desire further help.

l. A Dean's Conference will be proposed as an adjunct to this contract if there are indications that this will be an effective and efficient method of further dissemination and implementation of the materials and methods used in this contract.

m. A final report will be prepared on the project.

B. Final or Modified Scope of Contract

During the first year or Phase I, the following efforts were made in demonstration and dissemination:

A double National Workshop, limited to 36 (an additional 18 added) expense-paid participants plus observers was held in Washington, D.C., at the Washington Hilton Hotel on April 20-21, 1967, with 53 participants.

From the professional organizations who were contacted to announce this facility and service--over 80 requests for applications were received.

The individuals who completed the current five-day local sessions were asked to help recruit additional trainees. They helped to have every workshop overfilled.

Eighty-eight chairmen of Departments of Obstetrics and Gynecology of the medical schools were notified of the workshops. During the year nearly every OB-GYN Department in the U.S.A. and Canada was in contact with us.

Further dissemination was made at national and regional professional meetings which were attended and papers presented.

Questionnaires were prepared and revised to gather data on attitudes and other information as needed; these were used to revise and improve both the workshops and the local sessions. Summaries were attached to progress reports.

During the second year, or Phase II, the results of the first year were used to improve the dissemination effort.

Two national workshops were held in conjunction with professional meetings, with enrollment limited. These were: 1) The University of Rochester held in September 1967, with four sessions each given twice with 133 in attendance, and 2) the American Association for Cancer Education at Saratoga Springs in October 1967, with 59 in attendance. All sessions were overfilled.

The self-instructional materials that were developed are attached in the appendix.

The constantly revised and improved local sessions continued to train, in depth, those who attended workshops and desired further help. A total of 36 persons from 26 medical schools have been here for the five-day course.

A presentation was made at USOE Demonstration Center, Washington, D.C., on May 20, 1968.

A one-day workshop for the School of Dentistry, Medical College of Georgia, was held in the fall of 1968.

September 27, 1968

IV. PROGRAMS PREPARED BY VISITORS TO THE MEDICAL COLLEGE OF GEORGIA

LEARNING MATERIALS DIVISION
Medical College of Georgia
Augusta, Georgia 30902

Technical Consultants: P. L. Wilds, M.D.
Virginia Zachert, Ph.D.

Editorial Consultants: Thelma Clark
Gloria Peebles
Sandra Barrs

TITLE	AUTHOR	DATE	
Psychopathology 26 frames	Edward A. Tyler, M.D. Department of Psychiatry Indiana University	December	1965
Tumors of Head and Neck 225 frames	Robert F. Ryan, M.D. John Gage, Medical Student Curtis Graf, Medical Student Jim Knoepp, Medical Student Tulane University	April	1966-68
Aspects of Male Sexual Dysfunction, 9 pages	Anonymous	June	1966
Postpartum Bleeding 42 frames	Ronald A. Chez, M.D. Department of OB-GYN University of Pittsburgh	February	1967
Cytology Case 16 frames	George L. Wied, M.D. Department of OB-GYN University of Chicago	February	1967
Selected Fundamentals of Radiobiology, 142 frames	Marvin N. Lougheed, M.D. Department of Radiology McGill University	March	1967
Classification of Abortions 38 frames	Sanford Sall, M.D. Dorothy Stone, Ed.D. Department OB-GYN New York Medical College	June	1967
Female Sexual Response, 66 frames and Vaginal Discharge and Vaginal Infection, 72 frames	Lester Hibbard, M.D. Department of OB-GYN University of Southern California	July	1967
Late Obstetrical Hemorrhage 14 frames	Eugene Linton, M.D. Department of OB-GYN Bowman Gray School of Medicine	July	1967
Some Aspects of Patient Evaluation, 71 frames	Charles Butler, M.D. Department of OB-GYN Emory University	September	1967

TITLE	AUTHOR	DATE	
Uterine Displacement and Pelvic Relaxation 55 frames	Calvin Hull, M.D. Department of OB-GYN University of Mississippi	September	1967
Hypertensive Diseases 30 frames	James Mulé, M.D. Department of OB-GYN Louisiana State University	September	1967
The Rhythm Method of Family Planning, 74 pages	John J. McCarthy, M.D. Rev. John J. Seli Family Life Center Pittsburgh, Pennsylvania	September	1967
Introductory Principles of Urology, 174 frames	Roy W. Skoglund, M.D. Warren H. Chapman, M.D. University of Washington	October and March	1967 1968
Laboratory Assessment of Gonadotropin Activity 75 frames	Emmet J. Lamb, M.D. Stanford Medical Center Palo Alto, California	September	1967
Female Infertility, 29 frames and Third Trimester Bleeding, 54 frames	William G. McCormick, M.D. Department of OB-GYN Loma Linda University	September	1967
The Essentials of Hodgkin's Disease, 35 frames	I. E. Fortuny, M.D. Eric Overland, Medical Student Tutorial Cancer Teaching Program University of Minnesota	November and March	1967 1968
The Ultrastructure of Pathology, 108 frames	Stephen Soboroff, Medical Student Department of Pathology University of Illinois	November	1967
Cancer Chemotherapy With Cytotoxic Drugs: Part I Alkylating Drugs, 112 frames	V. K. Vaitkevicius, M.D. Department of Oncology Wayne State University	November	1967
Catalog Card Preparation and Catalog Maintenance 55 frames	Fred D. Bryant, Librarian Pennsylvania State University	February	1968
Respiratory Embryology 59 frames	D. G. Massey, M.D. Department of Medicine Université De Sherbrooke	April	1968
Review of the Pyramidal Tract, 26 frames	John W. Kemble, M.D. Central State Hospital Milledgeville, Georgia	June	1968
Uterine Myomata, 41 frames	Donald Zone, Medical Student Deaconess Hospital Buffalo, N. Y.	June	1968

TITLE	AUTHOR	DATE	
Postpartum Maternal Physical Findings, 36 frames	James M. O'Lane, M.D. Department of OB-GYN Temple University Medical School	June	1968
Chemotherapy of Cancer 28 frames	Jim Knoepp, Medical Student Tulane University	June	1968
Psychotropic Drugs 19 frames	Raymonde Marinier, D.Pharm. Facultie de Pharmacie University of Montreal	July	1968

PROGRAMS PREPARED BY MEDICAL COLLEGE OF GEORGIA PERSONNEL

LEARNING MATERIALS DIVISION
Medical College of Georgia
Augusta, Georgia 30902

Technical Consultants: P.L. Wilds, M.D.
Virginia Zachert, Ph.D.

Editorial Consultants: Thelma Clark
Gloria Peebles
Sandra Barrs

TITLE	AUTHOR	DATE	
Gynecologic Endocrinology Book I: 359 frames Book II: 619 frames	Cetin Kaya Aydar, Barbara Powell, Virginia Zachert	Spring	1964
Introduction to Medical Statistics, 94 frames	Harrison McDonald Medical Student	August	1965
A Preface to Genetics 94 frames	J. W. Spivey, Jr., Medical Student, and Virginia Zachert	December	1965
An Introduction to Steroid Biochemistry and Its Clinical Application 356 frames	Murray and Sandra Freedman Medical Students MCG Bookstore--$8.00	March October	1967 1967
Three Aspects of Vaginal Bleeding, 171 frames	Anonymous MCG Bookstore--$2.00	April	1967
Nursing Care of Patient With Cancer of Breast 172 frames	Leilee P. Ault Christine Walker, Nursing Student, and Constance Shaw School of Nursing	June	1967
Six Allergic Children 118 pages	Betty B. Wray and Frank P. Anderson	August	1967
Nursing Care of Patient With Cancer of Cervix 114 frames	M. Christine Walker, Graduate Nursing Student Leilee P. Ault, School of Nursing	September January	1967 1968
Clinical Anatomy of the Eye and the Bony Orbit 76 frames	Robert P. Thomas, Thomas Whelchel, Medical Student, and Allen Gattis, Medical Student	September January	1967 1968
The Fluid and Electrolyte Therapy of the Dehydrated Child, 36 frames	Gary M. Wright, Medical Student	October	1967
Development of Cancer Teaching Propaedeutic 103 pages	Robert L. Reynolds, et al.	August	1967
Cancer Pathology Propaedeutic, 413 frames	Hans J. Peters, et al.	August	1967

TITLE	AUTHOR	DATE	
Blood-Gas Exchange in Respiration, 69 frames	Bernard R. Simmons and Danny E. Askew, Medical Students	September April	1967 1968
Fetal Distress in Labor	C. B. Martin, Jr., M.D.	July	1968
The Education of the Unwed Pregnant Teenager	Edwin S. Bronstein, M.D.	July	1968

PROGRAMS PREPARED BY P. L. WILDS, M.D. AND VIRGINIA ZACHERT, PH.D.

LEARNING MATERIALS DIVISION
Medical College of Georgia
Augusta, Georgia 30902

TITLE	DATE
Essentials of Gynecologic Oncology 480 pages (828 frames) Charles C. Thomas, Pub.--$ 7.50	1967
Applications of Gynecologic Oncology 358 pages (357 frames) Charles C. Thomas, Pub.--$11.25	1967
Synopsis of Gynecologic Oncology (Deblanked Version) 94 pages (828 frames)	1967
Programmed Instruction in Teaching Gynecologic Cancer 220 pages MCG Bookstore--$2.00	1967
Neoplasms of the Uterine Cervix 382 frames	1968
Interim Report, Grant No. OEG-7-061206-2648, Multicategorical Evaluation of Performance in Clinical Problem-Solving Tests, 251 pages MCG Bookstore--$5.00	1968

-APPENDICES-

V. APPENDIX A --TYPICAL LIST OF ATTENDEES AT A 24-HOUR WORKSHOP

I. Participants *(Also included: Title of Program Written by Participant)

1. Ashcom, R. C., Maumee Valley Hospital, Toledo, Ohio
2. Andrews, J. R., Department of Radiology, Georgetown University Hospital
3. Armenia, C. S., Department of Obstetrics and Gynecology, State University of New York
4. Babcock, R. J., Department of Obstetrics and Gynecology, University of Utah College of Medicine (*Management of Post-Menopausal Adnexal Masses)
5. Bryans, F. E., Department of Obstetrics and Gynecology, University of British Columbia (*Arrested Progress In Labor)
6. Carter, J. E., Department of Obstetrics and Gynecology, Indiana University School of Medicine (*Programmed Case Presentation)
7. Cherny, Walter, Department of Obstetrics and Gynecology, Duke University School of Medicine
8. Daly, M. J., Department of Obstetrics and Gynecology, Temple University School of Medicine and Hospital (*Heart Failure In Pregnancy)
9. Davis, Clarence, Yale University (*Anencephaly)
10. Debrovner, C. H., Department of Obstetrics and Gynecology, New York University School of Medicine (*Heart Failure In Pregnancy)
11. Durkan, J. P., Department of Obstetrics and Gynecology, University of Maryland School of Medicine
12. Freeman, M. G., Department of Obstetrics and Gynecology, Emory University School of Medicine (*Third Trimester Bleeding)
13. Friedlander, R. L., Department of Obstetrics and Gynecology, Albany Medical College of Union University (*A Case Of Vaginal Bleeding In Pregnancy)
14. Goss, D. A., Department of Obstetrics and Gynecology, Vanderbilt University School of Medicine
15. Goplerud, Dr. R., Roswell Park Memorial Institute (*Abdominal Mass In Elderly Female)
16. Gunther, R. E., Department of Obstetrics and Gynecology, Stanford University School of Medicine
17. Haley, H. B., Jr., Department of Surgery, Loyola University, Stritch School of Medicine
18. Heinrichs, W. L., Department of Obstetrics and Gynecology, University of Oregon (*Post-Menopausal Bleeding)
19. Hibbard, Lester, University of Southern California (*No Given Title)
20. Hull, C. T., Department of Obstetrics and Gynecology, University of Mississippi School of Medicine (*Diabetes In Pregnancy)
21. Johnson, William, Wilmington, Delaware (* Ovarian Disease)
22. Kelly, J. V., Department of Obstetrics and Gynecology, University of Pennsylvania School of Medicine (*Premature Delivery)
23. Krantz, K. E., Department of Obstetrics and Gynecology, University of Kansas School of Medicine
24. Lagasse, L. D., Department of Obstetrics and Gynecology, University of California, Los Angeles School of Medicine
25. Lamb, E. J., Department of Obstetrics and Gynecology, Stanford University School of Medicine (*Amenorrhea And Galactorrhea)
26. LeBlanc, A. L., Department of Obstetrics and Gynecology, University of Texas Medical Branch
27. Leclerc, Jules, Department of Obstetrics and Gynecology, St-Sacrement Hospital (*Metrorrhagia)
28. Lee, J. H., Jr., Department of Obstetrics and Gynecology, Hahnemann Medical College and Hospital (*Post-Menopausal Bleeding)
29. Linton, E. B., Department of Obstetrics and Gynecology, Bowman Gray School of Medicine

30. Louis, John, Department of Medicine, Loyola University, Stritch School of Medicine (*The Anemic Female)
31. Makowski, E. L., Department of Obstetrics and Gynecology, University of Colorado School of Medicine (*Programmed Instruction In Teaching Patient Management)
32. McCarthy, J. J., Jr., Department of Obstetrics and Gynecology, University of Pittsburgh
33. McCormick, W. G., Department of Obstetrics and Gynecology, Loma Linda University School of Medicine
34. Moore, R. A., Department of Obstetrics and Gynecology, State University of New York Downstate Medical Center
35. Muckle, C. W., FACOG, 1806 Garrett Road, Lansdowne, Pennsylvania (* A Diagnostic Surprise)
36. Pelegrina-Sariego, I. A., Department of Obstetrics and Gynecology, University of Peurto Rico School of Medicine
37. Pettit, Mary, Department of Obstetrics and Gynecology, Woman's Medical College of Pennsylvania (*An Emergency Room Differential Diagnostic Problem)
38. Renaudin, W. S., Department of Obstetrics and Gynecology, Tulane University School of Medicine
39. Ridings, Ray, Department of Radiation Therapy, University of Missouri Medical Center (*Vaginal Tumor)
40. Robinson, S. C., Department of Obstetrics and Gynecology, Dalhousie University (*Pregnancy With Gestational Diabetes And Preeclampsia)
41. Sall, Sandford, New York Medical College
42. Sarto, Gloria E., Department of Obstetrics and Gynecology, University of Wisconsin Medical Center
43. Scott, Joe, Department of Obstetrics and Gynecology, University of Nebraska (*Vulvar Diseases)
44. Stenchever, M. A., Department of Obstetrics and Gynecology, Western Reserve University School of Medicine (*Management Of A Patient With Severe Menorrhagia And Dysmenorrhea)
45. Townsend, D. E., Department of Obstetrics and Gynecology, Harbor General Hospital (*Suspicious Pap Smear)

II. Guests

1. Bohannon, Carol, Administrative Secretary, Institutional Cancer Teaching Grant Committee
2. McPherson, James J., Dissemination Research Branch, Office of Education
3. Newton, Michael, ACOG, Chicago, Illinois

III. Consultants

1. Campbell, Colin, Department of Obstetrics and Gynecology, University of
2. Michigan
2. Chez, Ronald, Department of Obstetrics and Gynecology, University of Pittsburgh
3. Goebel, Capt. Lawrence, Office of Aerospace Research, USAF, Washington, D.C.
4. Messer, R. H., Department of Obstetrics and Gynecology, University of Nebraska

IV. Staff

1. Clark, Thelma, Evaluation Specialist, Department of OB-GYN, Programmed Instruction Division, Medical College of Georgia
2. Freedman, Murray, Senior Medical Student, Medical College of Georgia
3. Lovejoy, Harriet, Programming Editor, Programmed Instruction Division and Educational Research, Medical College of Georgia

4. Newton, Sandra, Junior Medical Student, Medical College of Georgia
5. Peebles, Gloria, Secretary, Department of OB-GYN, Programmed Instruction Division, Medical College of Georgia
6. Weeks, Sandra, Secretary, Department of OB-GYN, Programmed Instruction Division, Medical College of Georgia
7. Wilds, Preston Lea, Project Director, Department of OB-GYN, Programmed Instruction Division, Medical College of Georgia
8. Zachert, Virginia, Research Director, Department of OB-GYN, Programmed Instruction Division, Medical College of Georgia

APPENDIX B SUMMARY OF ATTITUDE SURVEY OF TWO GROUPS

WORKSHOP ATTITUDE QUESTIONNAIRE

GROUP 1

21 April 1967

Washington Hilton Hotel

1. The afternoon presentations were: interesting - well planned.

2. The afternoon work periods were: helpful + informative

3. The afternoon group talking sessions (4 to 6 people) were: Good

4. Dinner was: excellent

5. The evening work session was: useful - pointed out many difficulties in production

6. Breakfast was: excellent

7. The critiqueings a) made by others of my material were: illuminating

b) which I did of cases prepared by others were: useful - you learn well by others efforts.

8. The allergy in children cases were: useful

9. The biosynthesis text was: very good - very helpfull

10. The panel discussion was: very helpful

11. Lunch was:

12. Overall view of the Workshop: enjoyable + helpfull

13. The workbooks were: useful - will be good for reference

14. Do you feel more comfortable planning to prepare programmed materials?
Yes

15. Comments and suggestions for the next time such a workshop is done:
Enjoyed this well organized presentation very much. Enthusiasm is contagious.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

R

April 21, 1967

1. The afternoon presentations were:

    1. Interesting and well planned.
    2. -----
    3. Fair.
    4. Good.
    5. Excellent--clear statement of fundamentals.
    6. Fair.
    7. Informative.
    8. Instructive.
    9. Assumed that we knew more than we did.
    10. Good.
    11. Good.
    12. Could have been more basic and informative in mechanics of P.I.
    13. Average, too didactic.
    14. Vague and frustrating.
    15. Too didactic.
    16. Slow paced. Would suggest passing out lecture notes only after the talk.
    17. Good introduction.
    18. Good.
    19. Discouraging.
    20. Security in having printed material in front.
    21. Clear, interesting.
    22. Informative & stimulating.
    23. Good.
    24. Good.
    25. Stimulating and well organized.
    26. Adequate and gave enough basis to prepare a program. You might point out the similarity between your diagraming & computer programming.
    27. Good review.
    28. Very good in presenting a new idea.
    29. Very good.
    30. Good.
    31. Since much was reading of typed materials--probably could send it out in advance; material was excellent.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

2. The afternoon work periods were:

   1. Helpful & informative.
   2. -------
   3. Good.
   4. Good.
   5. The jump between problem 1 and 33 was almost too great for the novice--an intermediate case would help.
   6. Good.
   7. Helpful.
   8. Helpful in solidifying the didactic material.
   9. Fine.
   10. Good.
   11. Good.
   12. Fair compared to rest of program.
   13. Fair.
   14. Much better.
   15. Necessary.
   16. Valuable.
   17. Good.
   18. Seemed too short time.
   19. Good.
   20. -------
   21. Just long enough to keep me working fast.
   22. Instructive.
   23. Good.
   24. Interesting and helpful.
   25. Sufficient.
   26. Good--should be longer.
   27. Very good.
   28. Enough.
   29. Very good.
   30. Good.
   31. Very good.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

3. The afternoon group talking sessions (4 - 6 people) were:

1. Good.
2. -------
3. Good.
4. Good.
5. Useful--helped free communications.
6. Mediocre.
7. Good.
8. Of normal usefulness.
9. O.K.
10. Good--useful.
11. Fairly useful & helpful.
12. Good.
13. Of little value.
14. Adequate.
15. Very useful.
16. Most valuable.
17. Good--necessary to get the group thinking along specific lines.
18. -------
19. Good.
20. Here we could use more instruction as to our purpose.
21. Slow, as usual, until a group gets off the ground.
22. Helpful.
23. Not rewarding--but individual comments being good--I would like to have a recapitulation.
24. Helpful.
25. Satisfactory.
26. Too large--or perhaps just too many people in the room.
27. Interesting.
28. Very helpful--interchange of ideas good.
29. Fair.
30. --------
31. Helpful--probably could strengthen by ? more positive orientation ??

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

4. Dinner was:

1. Excellent.
2. The meals served to increase involvements and communication in the group.
3. Good.
4. Good.
5. Delightful.
6. Fine.
7. Excellent.
8. -------
9. Excellent.
10. Very nice.
11. Excellent.
12. Excellent.
13. --------
14. Good for food; no conversation about workshop.
15. Fine.
16. --------
17. Delightful.
18. Not attended.
19. --------
20. Great!
21. Not attended.
22. Excellent.
23. Excellent (and fattening).
24. Very pleasant.
25. Pleasing.
26. Delicious.
27. Excellent.
28. Excellent.
29. Excellent.
30. Excellent.
31. Fine.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

5. The evening work session was:

1. Useful--pointed out many difficulties in production.
2. --------
3. Work could have been done in individual's hotel room with less distractions.
4. Good.
5. Very valuable--a bit more introduction to the use of the sheets and the mechanics of construction would help.
6. Fine.
7. Good--too short a time for work performed.
8. Good learning experience.
9. We should have been required to diagram as we went.
10. Very good, most helpful for understanding and achievement.
11. Helpful.
12. Very informative.
13. --------
14. Excellent.
15. A shock; an example actually worked out before the group would be useful.
16. --------
17. A necessary step--worthwhile.
18. Not attended--regretfully.
19. --------
20. Perhaps the wrong time to prepare a case--too tired! You also must have time to type these?--
21. Too short.
22. Very instructive and humbling.
23. I was too tired to do my best.
24. An excellent idea--too little time allowed.
25. Challenging & stimulating.
26. The most valuable part.
27. Fine--had always been afraid to start a program.
28. Also good.
29. Extremely revealing and useful.
30. Instructive.
31. Excellent--a real introduction.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

6. Breakfast was:

   1. Excellent.
   2. Got the day swinging early.
   3. Good.
   4. Excellent.
   5. Very pleasant.
   6. Find.
   7. -------
   8. Good.
   9. ++++++
   10. -------
   11. Excellent.
   12. Good.
   13. -------
   14. Good for food; no conversation about workshop.
   15. O.K.
   16. I overslept.
   17. Fine.
   18. -------
   19. Excellent.
   20. Also excellent.
   21. Good.
   22. Excellent.
   23. Fine.
   24. Pleasant.
   25. Fine.
   26. Eye opening.
   27. Good.
   28. Excellent.
   29. Very good.
   30. Good.
   31. Fine.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

7. The critiquings
a) made by others of my material were:

1. Illuminating.
2. -------
3. Good.
4. Adequate.
5. Fair & justified.
6. Satisfactory.
7. O.K.
8. Helpful.
9. Helpful.
10. Fair and useful.
11. Most helpful.
12. Very helpful.
13. -------
14. Helpful.
15. Justified; this is very useful.
16. I overslept.
17. Quite pertinent.
18. -------
19. Stimulating.
20. Good--but by that time it was obvious to me.
21. Valid.
22. Quite good--I agreed with their criticisms.
23. Neutral.
24. Fair and helpful.
25. Educational and well thought out.
26. Eye opening.
27. Revealing--items thought to be "chatty" was called sarcastic or facetious.
28. Well done & helpful.
29. True and accurate.
30. Good.
31. Helpful--factive and true.

4/26/67/ghp

Workshop Attitude Questionnaire Comments --Washington Hilton Hotel

April 21, 1967

7. The critiqueings
   b) which I did of cases prepared by others were:

1. Useful--you learn well by others efforts.
2. -------
3. Interesting to see how various individuals organize their frames.
4. Fair.
5. Perhaps naive.
6. Satisfactory.
7. Informative.
8. Useful.
9. Made me understand my opinions better.
10. Helpful in assessing my own material.
11. Helpful in organizing my thoughts.
12. Also instructive.
13. -------
14. Very helpful to me.
15. Enlightening.
16. I overslept.
17. Inspired me that there was good general understanding of the method.
18. -------
19. Worthwhile.
20. Most instructive.
21. -------
22. Easy to criticize.
23. Facetious to some extent.
24. Educational to me.
25. Valuesome.
26. Hopefully "eye opening".
27. Felt I didn't know enough to fully evaluate.
28. -------
29. -------
30. Beneficial
31. I hope helpful.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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8. The allergy in children cases were:

1. Useful.
2. -------
3. Good.
4. Fair.
5. Very useful in showing the scope of programmed case.
6. Good.
7. Good.
8. Well done but still had limitations.
9. Learned something about pediatric allergy.
10. Helpful; well done in the main
11. OK
12. Good.
13. Good.
14. Helpful.
15. Presented too late in the workshop.
16. Excellent.
17. Most interesting--much more valid for gynecologists to start with an unfamiliar subject.
18. Good.
19. Good.
20. Vague.
21. Good for illustration purpose.
22. Good for reinforcement rather than imparting basic knowledge.
23. 1st good; 2nd
24. --------
25. More complete--but difficult to visualize patients with presented materials--need visual aid.
26. Interesting, informative.
27. Good--a little hard to follow.
28. Stimulating--would make me go to pre references.
29. Informative.
30. ----------
31. Very fine illustrative material.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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9. The biosynthesis text was:

1. Very good--very helpful.
2. -------
3. Excellent.
4. Excellent.
5. Clear valuable teaching--it leads a student step by step and prevents him from jumping too quickly or giving up altogether.
6. Superb.
7. Excellent.
8. Excellent because the nature of the material lent itself so well to programming.
9. Fine and very easy to follow.
10. Outstanding.
11. Superb.
12. Excellent.
13. Excellent.
14. Excellent.
15. Excellent.
16. Excellent.
17. Excellent--enlightening--shows that learning a difficult subject by frames can be fascinating.
18. Excellent.
19. Excellent--outstanding--very encouraging.
20. Great.
21. Fascinating.
22. Outstanding.
23. Impressive--but probably partially because my knowledge in field quite limited.
24. Splendid.
25. Excellent.
26. Interesting, informative--one of the best methods of presenting this information--you should do this first if you really want to sell the idea.
27. Excellent--partly due to type of material.
28. Interesting.
29. Excellent.
30. Excellent.
31. Beautifully laid out.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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10. The panel discussion was:

    1. Very helpful.
    2. -------
    3. Good.
    4. Good.
    5. Helpful--revealed role of the learner & student
    6. Good.
    7. Good.
    8. Interesting.
    9. -------
    10. Informative.
    11. Interesting but not necessary for successful workshop.
    12. Gave enthusiasm for the program.
    13. Good.
    14. OK
    15. The most useful.
    16. Good.
    17. Interesting.
    18. Very good--the students comments were greatly appreciated.
    19. Good.
    20. Stimulating.
    21. The highlight--I wanted student feed back.
    22. Informative.
    23. Excellent.
    24. -------
    25. Productive.
    26. Probably a waste of time--a short talk or teaching would do.
    27. Very good.
    28. Very revealing--makes you feel somewhat humble.
    29. Helpful.
    30. Had to leave.
    31. Helpful.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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11. Lunch was:

1. -----
2. -----
3. -----
4. -----
5. I had to leave before lunch.
6. Fine.
7. -----
8. -----
9. -----
10. -----
11. -----
12. Good.
13. -----
14. -----
15. -----
16. -----
17. -----
18. -----
19. Good.
20. -----
21. -----
22. -----
23. -----
24. -----
25. -----
26. Fine.
27. Not served yet.
28. Very good.
29. Good.
30. -----
31. Fine.

4/27/67 tc

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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12.0 Overall view of the Workshop:

1. Enjoyable and helpful.
2. Excellent; involving the participant is very good.
3. More time should have been spent in the organization of proper frames (objectives and logical sequence).
4. Good.
5. Most enjoyable and instructive; a totally new concept for me.
6. Illuminating.
7. Helpful in presenting what is involved in programming.
8. -----
9. -----
10. Very useful and informative; stimulation to extreme degree.
11. Most revealing and encouraging.
12. Excellent
13. -----
14. Helpful--needs to be digested.
15. A useful experience even if I never program anything.
16. Time well spent.
17. I am glad I participated--very well organized and thought out--important for our specialty.
18. Too short, however, understandably so.
19. Excellent and stimulating
20. Can't wait to do more
21. Very good; well prepared.
22. Instructive and challenging.
23. Excellent
24. -----
25. Educational, stimulating.
26. Well worth the time.
27. Excellent.
28. An excellent way to sell a system.
29. Very worthwhile and useful.
30. Excellent and stimulating
31. The sequencing of material--its broader outline--should be retained; it was very well done. I think it was a most excellent workshop. Although time is a problem, where possible, the working sessions might be extended.

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

13 The workbooks were:

1. Useful--will be good for reference.
2. Excellent.
3. Good.
4. Good.
5. Very valuable. I will keep and digest these again more carefully and use for others.
6. Good.
7. Good.
8. Well done and reinforcing.
9. All important.
10. Well prepared and will provide refresher or reference material in future.
11. Well done.
12. Very good.
13. -----
14. Helpful.
15. Important.
16. -----
17. Well organized, very well done!
18. Good.
19. Good.
20. Well prepared.
21. First class.
22. Very helpful and well-organized.
23. Excellent.
24. -----
25. Good.
26. I would like to have more of these.
27. Excellent.
28. Fine.
29. Satisfactory as new textbooks for an exposition of a new technique.
30. Good.
31. Good to work from.

4/27/67 tc

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

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14. Do you feel more comfortable planning to prepare programmed materials?

1. Yes.
2. Yes.
3. Yes.
4. Yes.
5. Yes.
6. Yes.
7. Slightly.
8. Yes
9. A little knowledge is a dangerous weapon.
10. Absolutely.
11. Yes, but not confident.
12. Yes.
13. Yes.
14. Yes.
15. To be sure.
16. Yes.
17. Yes, but more training would be necessary.
18. Probably less so since this short program points out the difficulties in making a "good program"--not just "a program."
19. Stimulated but not confident.
20. Yes.
21. Yes.
22. Yes.
23. Yes.
24. -----
25. Yes.
26. Yes.
27. Yes.
28. Beginning.
29. Much better now.
30. Yes.
31. No, but feel I have a better idea of what is needed.

4/27/67 tc

Workshop Attitude Questionnaire Comments -- Washington Hilton Hotel

April 21, 1967

15. Comments and suggestions for the next time such a workshop is done:

1. Enjoyed this well-organized presentation very much. Enthusiasm is contagious.
2. At beginning define the fact there are two primary uses (case management and didactic) and emphasize that both will be covered. During the first day I kept worrying about how to do text material.
3. Program or workshop should be given prior to a national meeting.
4. None.
5. -----
6. Do not use known info, e.g., gynecologic problems. Better to work at beginning with foreign material: Allergy. Next step - the complex and difficult to learn subject such as steroids.
7. -----
8. -----
9. Less time spent having everyone give personal evaluations. Save time by having group speakers.
10. More examples of both good and bad materials. Compare programmed learning to computer programming as an approach to introduction of feedback concept. An outstanding first effort!!!
11. Some of the discussions became too prolonged.
12. Greatest value to me was that I became more cognizant of my teaching format and I realize it could be presented in a more logical manner and with a wider scope by improving my communication and techniques to the student.
13. More theory of programming and less practicalities in the presentations. Less talk by participants (amateurs) and more by experts.
14. Send both a case program and a linear program to participants ahead of time and have them return it prior to meeting. Increase emphasis on linear programs.
15. A shock; an example actually worked out before the group would be useful. The presence of the consultants was helpful.
16. Start before the meeting (ACOG or other) so that meeting fatigue has set in.
17. Start out with the more interesting programs that were presented on the second day. These were stimulating and would induce a favorable attitude from the start. Also, let's develop a library of good programmed texts.
18. Suggest it not be at the end of a week long conference, if possible.
19. Better participant preparation before attendance.
20. Maybe start in A.M. and not have evening session?
21. You couldn't do more in this time. An extra day would allow one to revise his program effort and reconsider it. Two full days would be better.
22. Start with linear instruction before working into the more complex case presentation programming.
23. Should do more groundwork before taking course, read 3-4 programs, including bad ones. Also need more background information on goals and limitations of programming.
24. -----
25. Bit more basic instruction and direction regarding programming material.
26. Fewer people for more detailed analysis of program and problem.
27. None

Comments and suggestions for the next time such a workshop is done (continued):

28. Better not tied to another meeting as this is a little too much on top of ACOG.

29. Keep the introduction to the course simple (as it is now). Spend more time in allowing each participant to learn by doing both his own learning and by doing his own construction. Skip the meals--they are tasty but not essential to the course.

30. -----
31. The sequencing of material--its broader outline--should be retained; it was very well done. I think it was a most excellent workshop. Although time is a problem, where possible, the working sessions might be extended.
32. In the case presentations used, do you think most of the participants clearly differentiated between clinical content and teaching techniques?

SARATOGA SPRINGS WORKSHOP, OCTOBER 17-18, 1967 10/24/67/sv
SARATOGA SPRINGS, NEW YORK

ATTITUDE QUESTIONNAIRE -GROUP 2

I. TUESDAY AFTERNOON, OCTOBER 17

1. The Presentations Were:

1. Concise, but should not be read
2. Too fast for comprehension. Should be used to simplify and explain text.
3. Good.
4. Good.
5. Quite effective. Don't over estimate our original understanding.
6. Good.
7. Excellent.
8. Good.
9. Rapid, too concise but good when reviewed in the workbook.
10. Progressively more understandable. Please try to stay away from technical definitions.
11. Adequate--superfluous to text. Should sharpen definitions. Elaborate on text.
12. Necessary but followed book too closely. Slides not included in text are desirable.
13. Good.
14. Superfluous.
15. Adequate, but not very inspiring because of reading.
16. Hurried and occasionally not too clear. Needed reinforcement.
17. Concisely informative.
18. Should give a little more direction for work periods.
19. Tedious.
20. So concentrated that it was difficult to assimilate especially on first exposure.
21. Succinct but too fast for the complete voice. More examples or "frames" seem indicated.
22. Initially confusing. New terminology and purpose of programmed learning, however, as soon as objectives are noticed it's fascinating.
23. -----------------------
24. Too rapidly presented.
25. Good, but I wish they were supplementary and not directly from workbook.
26. Informative--concentrated and well organized.
27. Clear.
28. -----------------------
29. Initially frustrating but served the purpose of insuring our attention and participation.
30. Well illustrated.
31. Great. Tremendously organized.
32. Somewhat frustrating and probably not necessary; we could have read this.
33. Over my head, even when reading along in the text.
34. These would have been more effective if they were not read from the prepared text but used to explain or augment this material.
35. Introduction may have been better for us as learners, if it were broader.
36. Not very helpful. Lecture reading from text is not as helpful as reading it yourself.
37. Confusing.
38. Possibly unnecessary since material was covered in text.

39. Adequate for the allotted time, but not as informative as I expected.
40. Missed this.
41. Good.
42. Too brief. Following along in the workbook was helpful.
43. Difficult to follow at first because so much concentrated material was presented. Some orientation would be helpful. Later presentation good.

2. The Work Periods were:

1. Instructive.
2. Organized well. Of about right length.
3. Excellent.
4. Adequate.
5. Review of cases is very helpful in illustrating concepts.
6. Good.
7. Excellent.
8. Excellent.
9. Best of all. I can learn best by doing whether it be doing programs or writing programs.
10. Too long for tired old people. More breathing spells, please!
11. Adequate, but latter part of Tuesday afternoon was a bit of a grind.
12. Very worthwhile investment of time.
13. Excellent.
14. Satisfactory, but greater appreciation would be likely to result if they dealt in depth with the same subject.
15. Good.
16. Learned most from these applied learnings. Suspect more emphasis needed by example.
17. Useful in getting one's feet wet--coming to grips.
18. Good.
19. Valuable.
20. Too short.
21. Difficult to handle without previous applicable store of knowledge and experience--new words without explanatory frames lent confusion (Biased opinion since I am a dentist, nevertheless, I appreciate its learning potential).
22. Valuable because we gathered the "great" variation in "concept" of education; it is hard for some people to allow to accept change.
23. ----------------------
24. Excellent. "Broke ice immediately."
25. Excellent. The best learning seems to be "task oriented."
26. ----------------------
27. Interesting.
28. ----------------------
29. Initially frustrating but served the purpose of insuring our attention and participation.
30. Made the material applicable.
31. Necessary to program. Excellent.
32. Excellent, stimulating.
33. Excellent, although at points confusing.
34. Slow to start, relative to my appreciation, but quickly became more clear and informative.
35. OK.
36. Excellent.
37. Too fast (short).
38. Good.
39. Very informative.
40. ----------------------
41. Useful but presented abruptly, almost without warning.
42. Not long enough for novices.
43. Helpful in focusing attention on the points presented.

3. The Group Talking Sessions (4 to 6 people) were:

1. Fair.
2. Too diffuse.
3. Excellent.
4. Short.
5. Limited value--except for participation.
6. Useful. (1) Made participants of all--loosened people up. (2) Showed consensus or lack.
7. Good.
8. Not of much value.
9. Of least value to me. In smaller workshop where whole group could discuss might be of more interest.
10. Pleasant.
11. Good cross section of opinion.
12. Irregular. Sessions were great--others didn't get off the ground.
13. Very good.
14. Not long enough to permit discussion in depth. It was or tended to be superficial.
15. Good.
16. Ho-Hum!
17. Most useful especially with numerous groups reporting.
18. Good exchange and stimulating.
19. Uneven.
20. Dependent on individuals and background of group--Four dentists, One writer, Two surgeons, Ten OB-GYN--great interest shown.
21. Excellent--clarifying increased acceptance of this new modality.
22. Very informative and classified concepts "spilled" by "promoters" in previous period.
23. Generally too short.
24. Fair, usually dominated by few individuals who tended to be hostile to programming.
25. Interesting. Funny how similar the response of a group to a given stimulus.
26. Helpful and thought provoking. Discussions worthwhile.
27. Useful. Short discussions.
28. ---------------------------
29. Main advantage was demonstrating that others were in same situation.
30. Not as good as they could be. Better instructions to the leaders would help.
31. Too short.
32. Good to keep up interest, however, could have had structured questions.
33. Too rushed.
34. Helpful in solidifying understanding of objectives of this program.
35. There were more comments from all as we progressed to the point of understanding your motives.
36. Good but too long; each person should express opinion in group.
37. Informative.
38. Excellent but possibly should have been longer.
39. Necessary to reinforce my own thinking.
40. ----------------------
41. Useful to evaluate one's own reception--good.
42. Helpful.
43. ----------------------

II. TUESDAY EVENING, OCTOBER 17

4. The Panel Discussion was:

1. Somewhat superfluous, and occasionally over our heads.
2. Started too soon in view of slow hotel service.
3. Good, excellent and necessary.
4. Good.
5. Limited value, except for participation.
6. -----------------------
7. Good.
8. -----------------------
9. Quite interesting. Certainly it shows the aims of the authors of a program are quite different.
10. Not helpful at this time.
11. Not there.
12. Missed most of it. Fun but not specifically helpful.
13. Very good.
14. Did not attend.
15. Panel was obviously not ready to speak and we were not ready to ask.
16. Came in late. Not too helpful. My fault.
17. Most stimulating, relevant and useful.
18. Was good. Too short in time.
19. Did not attend.
20. Not present.
21. Unable to attend.
22. Too disjointed except for the complete understanding of Dr. Wilds and Zachert.
23. -----------------------
24. Of little value.
25. Oh boy. I didn't really develop any depth--only suggestions of controversy.
26. Too limited.
27. Both disjointed but useful.
28. Stimulating and brought out unsolved problems.
29. Not particularly helpful.
30. Revealing in the number and scope of people informed and using programs.
31. Premature. Omit and extend the one on Wednesday.
32. Good, but should have had more questions from the floor.
33. Unrevealing, somewhat too frivolous.
34. No comment as I arrived late to this session.
35. Interesting to get divergent opinions.
36. Fair for general orientation.
37. Heated.
38. Excellent except possibly too short.
39. Good.
40. Poor. May have reflected my previous answer.
41. Useful, particularly in disagreements.
42. Not particularly helpful.
43. Interesting.

5. The Work Session Was:

1. Vital--forced to apply the method.
2. Too late in day for work required More direct instruction at start of period would be helpful.
3. ----------------------
4. OK.
5. The creation of a case was very helpful. Helped to crystalize our ideas.
6. Amazing in that people of this seniority will work in this way at this hour of the night so effectively.
7. Excellent.
8. Good.
9. The most instructive of all parts. We needed basic information before the original effort, but the more doing with supervision the better.
10. Instructive. Perhaps the most enlightening exercise. I would like to have been given more advice before I started to work a problem.
11. ----------------------
12. More advice prior to session in scope of work would have been helpful.
13. Excellent.
14. Did not attend.
15. Good.
16. Very instructive (self). Made me realize I could do it but what a hard job it is.
17. Too brief for considered programming.
18. ----------------------
19. Good. Need more individual help.
20. Not present.
21. ----------------------
22. Very useful at least in realizing that programming is not easy and requires clear objectives and understanding of methods offered.
23. ----------------------
24. Excellent. Very stimulating but quite frustrating.
25. Again, no better way to learn than by doing.
26. Instructive. Approach to case work up and development clarified.
27. Enjoyable.
28. Finally forced me to write out a case!
29. Difficult, traumatic since this was my first experience with programming. Glad that I had the opportunity however.
30. Encouraging when we found it possible to create.
31. Too late. Fatiguing for me (up at 5 a.m., same day!!!)
32. Excellent, I really learned something.
33. Frightening at first, but then learned from.
34. Enlightening as to gaining an appreciation of the time and effort needed to develop programs.
35. Allowed us to apply what we had been told previously.
36. Most necessary to learning.
37. Rewarding.
38. A real work session for me. It pointed out just how much work is involved in programming and how important it is to adhere to objectives.

39. Difficult and very useful.
40. Excellent.
41. Too late in day (fatigue) and of limited usefulness except to recognize difficulties of preparation.
42. Difficult, because there was inadequate specific instruction.
43. Excellent as an introduction to programming.

III. WEDNESDAY MORNING, OCTOBER 18

6. The critiqueings: a) made by others of my material were:

1. Sometimes good, sometimes made from pompous ignorance.
2. Helpful and justified.
3. Helpful.
4. Good.
5. ----------------------
6. ----------------------
7. Good.
8. Fair.
9. Instructive and well thought out.
10. Good but perhaps superficial.
11. ----------------------
12. I didn't complete my case.
13. Excellent.
14. Did not participate.
15. Good and useful.
16. Unknown.
17. ----------------------
18. Constructive.
19. Helpful depending on individual.
20. Not done.
21. ----------------------
22. Very appropriate and fully agreed with them.
23. Some good, some inconsequential.
24. Very good.
25. Too kind.
26. Well taken but should have been more critical.
27. Unfair. Because of bad guidance on my part.
28. Superficial and without kid gloves.
29. Was not critical enough. He should have torn it apart.
30. Helpful and gave insight in developing.
31. ----------------------
32. More concerned with validity of my material than method of presentation.
33. Justified; if anything not sufficiently critical.
34. Objective and will be helpful in re-working the case.
35. Points up that it takes more than one sample case before we can be proficient at writing a program.
36. Fair (my program was poorer than they admitted).
37. Informative.
38. ----------------------
39. Not present.
40. Fair.
41. Good but would suggest concealed identities of writer and reviewer.
42. Interesting and, in most cases, valid.
43. Most helpful in pointing up deficiencies.

6. The Critiqueings: b) which I did of cases prepared by others were:

1. Interesting to me.
2. Helpful for understanding problems of programming.
3. Helpful to me.

4. Easy.
5. ----------------------
6. ----------------------
7. How do I know.
8. Good.
9. ?
10. More to the point than those made about my program.
11. ----------------------
12. Helped me greatly. Develops critical evaluation. One of best features of workshop.
13. Good.
14. Did not participate.
15. Useful.
16. Apparently I was not critical enough (according to one of my subjects).
17. ----------------------
18. ----------------------
19. Helpful but too many became a problem.
20. Not done.
21. ----------------------
22. Again at pointing that primary objective of case was not clear at end.
23. More on detail than on quality of case.
24. Very good.
25. Prove the point of a learner, definitely not as an expert.
26. One case well done. The second not so well prepared, but no doubt useful in student assignment.
27. I did approximately three and changed my ideas during this time--more critical.
28. Same.
29. One prepared by a dentist was quite good. Both cases needed structural revision but achieved the objective.
30. Encouraging.
31. ----------------------
32. Probably not too sophisticated, tried to criticize method, not presented facts.
33. Not done.
34. I hope also given in the above manner. (Objective and will be helpful in re-working the case.)
35. A clinical case I felt, should have been presented in a branching program, however, it was written and structured in a linear fashion.
36. Very helpful to me.
37. ----------------------
38. ----------------------
39. Not present.
40. Good, not superficial.
41. Amateurish and presented without authoritative background.
42. Educational to me.
43. Useful to show how various methods could be used in programming.

7. The Allergy in Children Cases Were:

    1. Instructive.
    2. Too repetitious. Too much atopic allergy.
    3. ----------------------
    4. Easy.
    5. Strange to me, but good teaching.
    6. ----------------------
    7. Excellent.
    8. Excellent.
    9. The combination of teaching and branching program content text seen Tuesday, A.M. was best. Critique: P 134, #18
    10. Bad, except for the last one.
    11. Good introduction prepares for clinical atmosphere.
    12. OK I guess, for purpose intended.
    13. Excellent.
    14. Useful, but this is a controversial area and many basic concepts are not adequately explained.
    15. Good.
    16. More helpful in reappraising prior knowledge than in teaching denovo.
    17. ----------------------
    18. Demonstrated method of learning and teaching concepts.
    19. Educational.
    20. Good.
    21. Excellent. Even for a dentist who lacked some of the preparatory clinical medical experience.
    22. Very informative and lack "clearly" gave perils of every day allergy.
    23. Foreign to me. I gained information.
    24. Good. Last one felt was quite long, could have two cases to present material.
    25. Good as illustrations.
    26. Well prepared--allowed areas for individual thinking and searching.
    27. Boring to me, but I am not interested in allergy.
    28. Informative.
    29. ----------------------
    30. Practical and really enjoyable or painless to follow.
    31. Very instructive.
    32. Interesting, but hard for me to take seriously as I have many preconcepts about allergy.
    33. Very good.
    34. Confusing at first but soon were understandable.
    35. Excellent.
    36. Interesting.
    37. ----------------------
    38. ----------------------
    39. ----------------------
    40. Inadequate for learning.
    41. Good.
    42. ----------------------
    43. Useful for teaching.

8. The Steroid Texts Were:

1. Excellent.
2. Good. Easy to follow, instructional and fun.
3. Excellent example.
4. Excellent.
5. Excellent. Format lends itself well to this presentation.
6. Excellent, but I'm somewhat expert in steroids.
7. Excellent.
8. Excellent.
9. Excellent. I would like it to be followed with a branching format program for clinical endocrinology.
10. Very good but only for memorizing and testing.
11. Interesting in terms of simplifying a somewhat confused area.
12. Outstanding.
13. Excellent +
14. Potentially useful and perhaps would be most useful for the poor learners.
15. Excellent.
16. Superb method of making dry material fun. Holds attention where otherwise difficult. May require immediate reinforcement.
17. ----------------------
18. Excellent.
19. Beautiful.
20. Excellent.
21. Beautifully presented and logically sequential.
22. Excellent. I wish I could have had them three months ago when I was taking the boards.
23. Quite foreign to me and seemed a much better approach than the last time I worked on this.
24. Excellent.
25. Excellent ways of learning "facts".
26. Seemingly excellent. Not enough time to further evaluate.
27. Excellent.
28. Magnificent.
29. Superb and beautifully illustrative of linear programming.
30. More difficult but this is probably because of the nature of the material.
31. Superb.
32. Excellent!!!!!
33. Absolutely excellent.
34. Excellent.
35. Excellent.
36. Excellent teaching and learning techniques for those without knowledge.
37. Exceptional.
38. ----------------------
39. ----------------------
40. Excellent.
41. Particularly good.
42. Excellent; they follow a logical progression in demonstrating differences in structure which largely determine function and effects.
43. Superior in presenting a difficult subject.

9. The Panel Discussions Were:

    1. Somewhat anticlimactic.
    2. ----------------------
    3. Weakest element. Short.
    4. Fair.
    5. Again, I like these.
    6. ----------------------
    7. ----------------------
    8. ----------------------
    9. ----------------------
    10. Not as productive as I would have expected.
    11. Good. More in sympathy with your effort.
    12. Freedman's--good they speak with authority from experience as simultaneous learners and programmers. Full panel--Quite good because of audience participation.
    13. Good.
    14. Of limited value, due to lack of logical preparation on the part of panel members.
    15. Panel needs more prompting.
    16. Not too helpful.
    17. Same comments as above (Tuesday evening).
    18. ----------------------
    19. Not exciting--too frequent.
    20. Not present Tuesday P.M.
    21. ----------------------
    22. The Freedmans were very realistic and taught me the lesson "that whatever way," present day methods (classical) of medical education are obsolete.
    23. Good, lively, to pertinent points.
    24. Very good.
    25. Good.
    26. ----------------------
    27. Not heard.
    28. ----------------------
    29. ----------------------
    30. Helpful to know how to enlist help in writing programs.
    31. Much more helpful (Especially the Freedman's).
    32. Not really very helpful, served to introduce your consultants.
    33. No comment.
    34. ----------------------
    35. ?
    36. Not too helpful.
    37. ----------------------
    38. ----------------------
    39. ----------------------
    40. ----------------------
    41. Generally useful but not as good as direct presentations.
    42. Helpful.
    43. ----------------------

IV. SUMMARY

10. Overall View of the Workshop:

1. Good introduction to the field.
2. Good, fast overview of programming.
3. Inspiring.
4. Stimulating.
5. Worthwhile.
6. ----------------------
7. Excellent.
8. Excellent.
9. Most instructive.
10. I couldn't think of any better way. Can you?
11. A sense of being huckstered and over enthusiasm initially dismaying--latter part of program looked more interesting.
12. Fine contribution.
13. Excellent.
14. The length of the sessions (2-6 Tuesday afternoon) was much too long. Efficiency is lost in an exponential fashion after the first 50 minutes.
15. Very good.
16. Most valuable introduction. Hope I can find the future time to follow through, but may not.
17. Very pleased to have attended; discriminations and insights will be useful in my own preparation of educational material (which is not printed programs).
18. Well organized, stimulating, and constructive.
19. Maybe it can be programmed; appreciate effort of participants.
20. Interesting and enjoyable.
21. Confounding in the beginning--much better by Wednesday, A.M.
22. Stimulating, enlightening and really focusing on realities of near future of medical education, which in your way is more in keeping with modern methods in grade and high school education. Lectures for new generation are like a poor sermon.
23. Stimulating and raises real questions as to whether I have considered the student's position.
24. Excellent.
25. Too short!
26. A splendid and stimulating exposure. Exciting.
27. It was put on very expertly and well. Gave a fair appraisal of the status of programming and a good indication of "how to".
28. Worthwhile even though I had been down for a few days to Augusta.
29. Worthwhile.
30. Worthwhile experience.
31. Very much worthwhile. Has stimulated my appetite..
32. Time very well spent. Stimulated great interest (on my part) to study and participate in this some more.
33. A swift introduction, needing however, further elaboration for more understanding of the programming technique.
34. Very beneficial. I hope to pursue this modality of teaching aid further.
35. Very good.
36. Excellent.
37. Successful; too much to be done at home.
38. Very worthwhile since we soon will undertake programming part of our Oral Cancer Diagnosis Course.

39. Informative.
40. What I attended was excellent.
41. Beneficial but overwhelming information in a too short time. More information preferred to our own writing.
42. Worthwhile, but needs to have more time.
43. A very valuable experience.

11. The Workbook was:

1. Adequate.
2. Seems well-organized and logical. Will be able to judge better after having read it.
3. Useful.
4. Good.
5. Good. I'll take it home and refer to it all. I'll take the Steroid Biosynthesis to two professors in our faculty.
6. -----------------------
7. Excellent.
8. Good.
9. Well thought out. Could be polished by putting the "Start Here↓" on the logical left side.
10. Real good.
11. Introduction and definitions not convincing.
12. Well done.
13. Very good.
14. -----------------------
15. Good.
16. Is something I'll have to restudy. Can't make worthwhile evaluation now.
17. Good, helpful, excellent orientation.
18. -----------------------
19. Necessary and will be used at home.
20. Most useful.
21. -----------------------
22. Informative more so after it settles.
23. Good.
24. Good.
25. Excellent.
26. A substantial guide and helped in getting one's feet on the ground.
27. Very adequate for its purpose.
28. -----------------------
29. Served its function very well.
30. Important part and without it I would have had difficulty following.
31. Excellent.
32. Good for the example given. I am sure I will use it as a reference.
33. Good.
34. -----------------------
35. Good and I'm looking forward to going over it again more closely.
36. Good.
37. OK.
38. Good.
39. Good.
40. Good though Dr. Wilds was repetitive of the book.
41. Useful.
42. Very helpful.
43. Excellent. Something to take away for more detailed study.

12. Do You Feel More Comfortable Planning to Prepare Programmed Materials?

1. Yes.
2. No
3. Yes.
4. Yes.
5. Somewhat.
6. ------------------------
7. Yes.
8. Yes.
9. Unqualified Yes.
10. Absolutely.
11. Have been prompted to "look out" and follow with interest, particularly when significant evaluation of program has been made.
12. Much more comfortable.
13. Yes.
14. ------------------------
15. Yes.
16. Yes.
17. Yes.
18. Yes, more comfortable, but a need for training in programming.
19. Definitely.
20. Yes.
21. More aware of its possibilities.
22. If not more comfortable at least very inspired and anxious to submit myself to the five days in Augusta.
23. Yes.
24. Less confident but more aware.
25. Definitely.
26. In a sense, I will need much more instruction prior to understanding a serious project in the area of programmed learning.
27. I knew nothing about it before the session but am still by no means comfortable.
28. Yes.
29. Yes.
30. Yes.
31. For the first time I have some concept.
32. Of course I knew nothing about this phase of education before.
33. Not yet.
34. Yes.
35. Yes.
36. Yes.
37. Yes.
38. Yes.
39. I need a great deal more instructing and educating in this field.
40. ?????
41. Better informed but far from prepared.
42. Yes.
43. Yes.

V. Comments and Suggestions For the Next Time Such a Workshop is Held:

1. Would like to see workshop directed not at problem case, but to a problem (etiological) in medicine (i.e., like the program I wrote, only in depth).
2. Slower introduction. More explanation of objectives and philosophy of programming.
   Too much material presented in time available. Either practice in programming or consideration of linear programming should have been omitted.
3. Make panel shorter and smaller. This was an excellent program.
4. Some indications, suggestions, about forming objectives. They are described as "most important" but little detailed discussion of them.
5. ------------------------
6. First introduction should possibly include actual definition of programming. Also other technical modifications such as computer simulation.
7. Just keep it up.
8. ------------------------
9. Could a workbook be produced which would give the didactic material and examples of branching and linear programming? Thus if these would be sent out before the workshop begins, then the workshop itself can be devoted more to constructing programs and facing the task with supervision since the background could already be digested. There could be more instruction in how to arrive at realistic aims and how to start. There also might be more on how to evaluate. Certainly students must do this but how much? How do you know when you are done?
10. I am tired!
11. Start with didactic programming introduction and concepts, then present clinical management last.
12. About one more day. This was a little too rushed. Perhaps have a "Part II" for same group next year.
13. Repeat same and discuss a few samples of the critiques by the leaders of the workshop.
14. ------------------------
15. The Wednesday morning was very good but more time should be allowed for small group work.
16. Following another meeting is bad--hurts the attention span.
    Group too large.
    In general, Dr. Zachert's strong sense of agenda produced a procrustean bed, which I don't criticize but simply express as an opinion.
17. ------------------------
18. ------------------------
19. Appreciate liberal use of materials. We need more time to prepare programs. YOU need better method to do same thing mechanically speaking. Keep looking for more practical way to program--erasure, plastic overlay, etc.
    Maybe prepare a program in groups.
20. Have now attended two sessions and I need to come to Augusta! Do not believe that any shorter exposure will be efficient in planning to give individual any feeling of real competence.
21. Preparatory material distributions might make the first exposure confusing and more enthusiastically acceptable.

22. Stress and define the "objectives" because this is undoubtedly the meat of the program. I would not change the method because at the end of the workshop all the rebellion of the first days had been completely "tamed".
23. I think the time about right. I didn't learn as much as I would like to know, but got enough of a stimulus that I have good intentions of following up.
24. ------------------------
25. For the time alloted was excellent. Wish the conference were longer.
26. ------------------------
27. A future meeting for me personally would require a more detailed explanation of points raised. For a new audience, the present format is excellent.
28. ------------------------
29. Smaller groups.
30. Instruct the group on importance of limiting the scope or objectives before they try to write a case type program themselves.
31. Two whole days rather than 1½ with so much, so that we may get to bed a little earlier on Tuesday night.
32. (1) Allow audience to read short portions of the text and then narrator (Dr. Wilds) can emphasize, comment, questions, etc.
    (2) Might give out same case summary to all and have each program in his own way.
    (3) Give participants all of the programmed series you can so he may take it home. Thank you.
33. To allow more time and not to work by the clock.
34. I think it would be helpful to begin with the linear program and then proceed to the didactic form.
35. This workshop would have been better if it had been a little longer to allow us to improve our programming skills. All of us can't spend a week with you.
36. ------------------------
37. I must spend a week.
38. Possibly more time spent in small group discussions.
39. Should be much longer--with emphasis on principles as well as on techniques.
40. ------------------------
41. More time allotted if possible.
42. More time. More specific and detailed instruction in preparing various types of programming, and more group discussions.
43. Perhaps a 30 minute orientation lecture explaining certain terms. Illustrating on blackboard or screen certain types of programs, etc. would be helpful.

APPENDIX C

CALENDAR OF VISITS TO LEARNING MATERIALS DIVISION

1965

December	Dr. Edward A. Tyler Department of Psychiatry Indiana University Indianapolis, Indiana

1966

April	*Dr. Robert Ryan Department of Surgery Tulane Medical School New Orleans, Louisiana
May 21-22	*Melvin Tresh (Medical Student) Department of Surgery Duke University Medical Center Durham, North Carolina
June	*John Gage Senior Medical Student Tulane Medical School New Orleans, Louisiana
August 31	Dr. Charles F. Reed University of Iowa College of Medicine Iowa City, Iowa
September 3	Dr. Harold Haley Stritch School of Medicine Hines, Illinois

1967

January 24-26	*Dr. Charles Butler Department of OB-GYN Emory University Atlanta, Georgia
February 19-20	Mr. W. A. Richardson Chairman of the Board Medical Economics, Inc. Oradell, New Jersey
February 19-24	*Dr. George L. Wied and *Miss Catherine Keebler University of Chicago Medical School Chicago, Illinois

1967

February 20-23	*Dr. Ronald Chez Department of OB-GYN University of Pittsburgh Medical School Pittsburgh, Pennsylvania
March 6-10	*Dr. Marvin N. Lougheed Department of Radiology Montreal 25, Quebec, Canada
June	*Dr. John J. McCarthy *Rev. John J. Seli Family Life Center Pittsburgh, Pennsylvania
June 12-16	Dr. Richard C. Ashcome Maumee Valley Hospital 2025 Arlington Avenue Toledo, Ohio
June 19-23	*Dr. Sanford Sall and *Dr. Dorothy Stone New York Medical College Department of OB-GYN New York 29, New York
June 25-30	*Dr. James H. Lee, Jr. Hahnemann Medical College and Hospital Philadelphia, Pennsylvania
June 30	Dr. Kaplan Public Health Service Department of Health, Education and Welfare Washington, D. C.
July 10-14	*Dr. Eugene B. Linton Department of OB-GYN Bowman Gray School of Medicine Winston-Salem, North Carolina
July 24-27	*Dr. Lester T. Hibbard Department of OB-GYN University of Southern California Los Angeles, California
	*Mr. Curtis Graf Third Year Medical Student Tulane Medical School New Orleans, Louisiana
April - July	Mr. Robert Reynolds Private Consultant Atlanta, Georgia
	Dr. Joseph Hammock Department of Psychology University of Athens Athens, Georgia

1967

April - July	Dr. Hans Peters Chairman Saint Frances Hospital Columbus, Georgia
August 22	Dr. Curtis Worthington Assistant Dean of Medical School of South Carolina
September 17-22	*Dr. Calvin T. Hull Department of OB-GYN University Medical Center Jackson, Mississippi
September 25-30	*Dr. William G. McCormick Department of OB-GYN Loma Linda University Loma Linda, California
	*Dr. James Mulé Department of OB-GYN Louisiana State University New Orleans 12, Louisiana
October 22-27	*Dr. Roy Skoglund and *Dr. Warren H. Chapman Department of Urology University of Washington Seattle, Washington
October 24-29	*Dr. Emmet J. Lamb Stanford Medical Center Palo Alto, California
October 29 - November 2	*Stephen Soboroff (Medical Student) Department of Pathology University of Illinois Chicago, Illinois
November 19-24	*Dr. V. K. Vaitkevicius Chairman, Department of Oncology Wayne State University Detroit, Michigan

1968

February 4-9	*Dr. I. E. Fortuny and *Eric Overland (Medical Student) Department of Oncology University of Minnesota Minneapolis, Minnesota
	*Mr. Fred Bryant, Librarian Department of Bioscience Communication Hershey Medical School Hershey, Pennsylvania

March 11-12	Mrs. JoAnne Patray and Staff Department of Pediatrics University of Florida School of Nursing Gainesville, Florida
April 1-5	*Dr. D. G. Massey Department of Medicine Universite De Sherbrooke Sherbrooke, P. Q., Canada
June 13-14	Mr. Brad Claxton Richardson-Merrell Cincinnati, Ohio
June 17-22	*Dr. Woong Jin Rho (Resident) *Donald Zone (Medical Student) Deaconess Hospital Buffalo, New York
	*Dr. J. M. O'Lane Department of OB-GYN Temple University Philadelphia, Pennsylvania
	*Dr. John Kemble Central State Hospital Milledgeville, Georgia
	*Jim Knoepp (Medical Student Department of Surgery Tulane Medical School New Orleans, Louisiana
July 1-6	*Dr. Bart Martin and *Dr. Edwin S. Bronstein Department of OB-GYN Medical College of Georgia Augusta, Georgia
	*Dr. Raymonde Marinier, D.Pharmacie Faculte de Pharmacie University of Montreal Montreal, Quebec, Canada
July 15	Mrs. Doris Payne University of Florida School of Nursing Gainesville, Florida

* Indicates they took the five-day local training program.

(This listing does not include the dozens of students and residents of the Medical College of Georgia Schools of Nursing and Medicine who worked on programmed materials during the years.)

APPENDIX D

A List of some persons receiving "Reprint Package".

(This package contains:

A. Reprints of articles written by Preston Lea Wilds, M.D. and Virginia Zachert, Ph.D.:

   1. "Evaluation of a Programmed Text in Six Medical Schools"
   2. "Teaching Machines and Programmed Instruction"
   3. "Programmed Instruction in Gynecologic Cancer at the Medical Student Level"

B. Brochures on two books written by Preston Lea Wilds, M.D. and Virginia Zachert, Ph.D.:

   1. Applications of Gynecologic Oncology
   2. Essentials of Gynecologic Oncology

C. Programmed Instruction in Teaching Gynecologic Cancer

   by Preston Lea Wilds, M.D. and Virginia Zachert, Ph.D.

D. A bibliography of programs prepared by visitors to the Medical College of Georgia, personnel of the Medical College of Georgia, and Preston Lea Wilds, M.D. and Virginia Zachert, Ph.D.

E. Sample booklet from programmed text, "An Introduction to Steroid Biochemistry and Its Clinical Application" by Murray Freedman, M.D. and Sandra Freedman, M.D.)

PERSONS RECEIVING "REPRINT PACKAGE"

Alexandre Meisels, M.D., Laboratorire De Cytologie, Institut D'Anatomie Pathologique, Université Laval, Quebec 10, P.Q., Canada

D. L. Sackett, M.D., Clinical Epidemiology Unit, Departments of Medicine & Preventive Medicine, State University of New York at Buffalo, 462 Grider Street, Buffalo, N.Y.

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Harold Jeghers, M.D., Medical Director, Saint Vincent Hospital, 25 Winthrop Street, Worcester, Massachusetts 06104

Howard Ulfelder, M.D., Harvard Medical School, Massachusetts General Hospital, Boston 14, Massachusetts

Nuri Sağiroğlu, M.D., Assistant Professor & Head of Department, Department of Cytopathology & Cancer Research, Hacettepe University Medical Center and Hacettepe Faculty of Medicine, Ankara, Turkey

Doctor Lapis, Postgraduate Medical School, Department of Pathology, Budapest XIII, Szabolcs u. 33., Hungary

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APPENDIX E

-WORKSHOP-

PROGRAMMED INSTRUCTION IN TEACHING PATIENT MANAGEMENT

PRESTON LEA WILDS, M.D., AND VIRGINIA ZACHERT, PH.D.

1828

LEARNING MATERIALS DIVISION
Medical College of Georgia
Augusta, Georgia

DECEMBER 1968

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-ABSTRACT-

The two half-day sessions held by Preston Lea Wilds, M.D., and Virginia Zachert, Ph.D., will be in "workshop" format in which the participants will work in small groups to criticise short lectures on such subjects as "Objectives in Teaching," "Strategies in Teaching Inquiry," and "Teaching Controversy." They will work through prepared programmed cases, develop objectives and strategies on specific materials, and prepare short teaching programs--both individually and in groups.

A bibliography of available medical self-teaching materials will be presented. Methods for obtaining the help of students, residents, and patients in preparing programmed materials will be discussed.

AUTHORS' WARNING

The assimilation of the contents of this workshop have been demonstrated to require 24 hours of concentrated effort, in group settings. Unwary persons who attempt to master this material with less effort, or without the support of the group, are likely to be misled, or to suffer from indigestion.

P. L. Wilds, M.D.
V. Zachert, Ph.D.

12/4/68/ghp

-AGENDA-

"PROGRAMMED INSTRUCTION IN TEACHING PATIENT MANAGEMENT"

FIRST DAY

2:00 to 2:05 PM — Introduction: Dr. Wilds

Summary: What the Workshop IS About:

1. How to guide the student into learning to process clinical information appropriately on his own.
2. How programmed materials can be developed by teachers and students.

2:05 to 2:30 PM — Illustrated Talk: Dr. Wilds

"Objectives and Rationale of Case-Presentation Teaching Using Programmed Materials"

Summary: Expert patient management calls for highly developed skills in inquiry as well as expertness in answer-finding. Learning these skills involves the following:

1. Facility in handling complex, conflicting probability estimates.
2. Development of unique, personal strategies for problem solving.
3. Maintenance of an open approach to inquiry.

Skill in inquiry is acquired only by practice in solving problems which require inquiry.

2:30 to 2:50 PM — Participants work through two cases.

2:50 to 3:00 PM — Small group discussions.

3:00 to 3:10 PM — Talk back.

3:10 to 3:30 PM — Illustrated Talk: Dr. Wilds

"Strategies for Teaching Inquiry Skills Using Programmed Cases."

Summary: Students, working with live patients, are confronted with clinical problems in a random sequence. They learn, but their learning is equivalent in efficiency to learning from random texts with the pages in random order. Although there is no substitute for real life experience in working with patients, a series of programmed cases can offer all students a condensed clinical experience arranged in a sequence to produce efficient learning. Such an approach permits the student to practice solving a wide variety of problems requiring inquiry. This variety is not available to the student with conventional group instruction.

3:30 to 4:00 PM — Participants work through two more cases.

4:00 to 4:10 PM — Coffee.

4:10 to 4:20 PM — Small group discussions.

4:20 to 4:30 PM — Talk back.

4:30 to 5:00 PM — Example of a Three-dimensional, Learning-Teaching Problem: Dr. Zachert

5:00 to 5:10 PM — The Steps in Programming: Dr. Wilds

5:10 to 5:30 PM — Orientation and assignments for evening program: Dr. Zachert

5:30 to 6:00 PM — Questions and discussion.

FIRST DAY EVENING PROGRAM

8:00 to 10:30 PM — Preparation of cases by participants.

Summary: You can do it yourself. Clinical teachers already have the skills to prepare satisfactory case presentation programs.

10:30 PM — Adjourn.

SECOND DAY

8:00 to 9:00 AM — Review of cases within groups.

Summary: Peers make good critics.

9:00 to 9:10 AM — Group discussions.

9:10 to 9:20 AM — Talk back.

9:20 to 9:30 AM -- Illustrated Talk: Dr. Wilds

"Teaching Controversial Materials by Means of Programmed Instruction."

9:30 to 9:45 AM -- Open discussion.

9:45 to 10:10 AM -- Reading assignments.

Summary: Participants work through portions of a new "content" text.

10:10 to 10:30 AM -- Illustrated Talk: Dr. Zachert

"Good Programs That Do Not Teach."

Summary: "If you're not sure where you're going, you're liable to end up somewhere else."

10:30 to 11:00 AM -- Coffee and discussion.

11:00 to 11:40 AM -- Panel: "Where Do We Go From Here?"

Panelists: Dr. Joe Hammock
Mr. Robert Reynolds
Dr. P. L. Wilds
Dr. Zachert--Moderator

Summary: "You don't have to do it yourself."

11:40 AM to 12:00 NOON -- Talk back and Conclusion.

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I. INTRODUCTION

The purpose of this course is to show how programmed instruction, using several quite different approaches, can be developed to achieve effective communication with the resident, physician, medical student, and the patient. The first approach for consideration is a case presentation format developed to train undergraduate medical students in clinical problem solving. Later programmed approaches to factual materials or "content" will be studied. Many different formats are available for consideration. The emphasis in this course, however, will be an offering experience in the processes of programmed instruction and on studying methods which lead to effective communication, rather than on the advantages or disadvantages of particular formats.

First on the agenda is a consideration of how case presentations may be used to teach clinical problem solving. The purpose of the case presentations is to give the student practice in learning to reason like a clinician. They do not attempt to teach the student how to interview a patient, or palpate a tumor, or evaluate an X-ray. Such techniques of gathering clinical information are taught effectively by other methods. Rather, the cases are designed to give the student experience in evaluating and processing clinical information as it is received.

Any attempt to encourage the student to acquire a clinical orientation early in his career carries with it certain liabilities. There is the danger that the complexities of being or becoming a skilled clinician may be underestimated. The programmed cases may misrepresent the task of solving clinical problems as being simpler than it really is.

This seems to be a real danger. It puts the burden on the programmer to establish that his objectives are worthy, that they fully represent the complexities of what the student must learn, and that his objectives are worthy, that they fully represent the complexities of what the student must learn, and that the programmed materials are of sufficient quality to teach the objectives.

The proper persons to set the objectives are teachers, not students. Teachers, on the other hand, are handicapped in judging the teaching effectiveness of instructional materials in their fields because they are teachers, not learners. A teacher with expert knowledge cannot put himself in the role of the learner and make a realistic appraisal of the student's difficulties in learning the subject in which the teacher is already an expert. He must depend upon the student to give him expert advice on the problems and difficulties of learning the subject. The key to programmed instruction is the student's active participation in the learning process. Because the student participates actively rather than passively, the teacher can observe this participation and use the observations to improve methods of teaching.

II. OBJECTIVES AND RATIONALE OF CASE-PRESENTATION TEACHING USING PROGRAMMED MATERIALS

The transformation of a medical student into a skilled clinician is a process which requires experience with hundreds of patients distributed over a learning period of four or more years. Programmed instruction is not likely to accomplish four years' work overnight; in fact, programmed instruction has not been proven to be inherently more efficient or effective than other methods of instruction. The increased efficiency or effectiveness of programmed instruction relates to the methods of preparing programmed instruction leading to the recognition and removal of inefficiencies which persist unnoticed in most of the other instructional media. Programmed instruction, in order to function at all, must have defined or definable objectives. It must communicate, otherwise self instruction does not occur. In comparison, a lecturer can give classes for years without even considering problems of objectives, communication, or evaluation.

A proper starting point is to look at the nature of what the student must learn. Patient management is a complex and highly variable process. It is appropriate to consider two stages of clinical problem solving.

1. The stage of inquiry
2. The stage of problem resolution

The stage of inquiry usually involves two steps: finding the problem, then defining it. Finding the problem may be easy or extremely difficult. Sometimes the patient tells you, "My problem is such and such." On the other hand, sometimes much information must be obtained and evaluated in order to recognize the full scope of the patient's difficulties, which may be perceived quite differently by the physician than by the patient. The possible approaches for collecting information leading to the problem are many and varied, but the process is not a random one; information must be collected with a proper consideration for effectiveness, efficiency and patient safety.

After the problem or problems have been identified, the stage of inquiry continues with attempts to define them. The majority of clinical problems require that a surprisingly large amount of information be collected and evaluated in order to define the patient's problem precisely and rule out complicating conditions. In history and physical examination alone, the work-up of the usual medical or surgical patient calls for collecting and evaluating information in more than 50 different categories. The more information the physician collects, the more he must call upon and apply his fund of specialized medical knowledge and the more selective he must be to obtain this information in a safe and efficient sequence, constantly modifying his plan in the light of new information as he receives it. During this process he must decide when he has collected enough information to proceed with formulating a plan for treatment or disposition of the patient. The decision, "How much information is enough?", may be based on only a few items, in extreme emergency conditions, or on hundreds of items in many chronic conditions, but in every case it involves a series of complex probability estimates which the physician often makes unconsciously.

The stage of problem resolution differs from simpler and more static types of "puzzle solving" because it involves concurrent inquiry or discovery as well as answer finding. Part of the problem is that the patient's difficulties must be recognized and defined in the process of being resolved. Sometimes, a clear separation is possible. Management, therapy or disposition of the patient's problems, once they have been defined, can often be represented on paper as simple "Yes-No" decisions. The process of making these decisions, however, is seldom simple. It often requires the physician to handle dozens of items of highly specialized information, much of which is incomplete or conflicting, before he can reach conclusions which permit overt action. For other problems, the stages of inquiry and resolution remain inseparably intertwined. Appropriate management requires a prolonged series of therapeutic trials which must be carried out concurrently with gathering and evaluating further information about the patient's response to the trials.

Effective, efficient clinical problem solving has some characteristics which are generally recognized as desirable. In attempting to describe the characteristics of clinical problem solving, people will differ in their language and in what they select and emphasize.

Here is one such attempt:

1. The initial approach to the problem is comprehensive in scope.
2. As information accumulates, the goals of inquiry are continually re-evaluated and the problems are redefined.
3. The acquisition of information becomes increasingly selective:
    a. Unnecessary risks are minimized
    b. Important problems are given priority over inconsequential ones
    c. Efficient sequences are preferable to less efficient ones.
4. Urgent situations, needing prompt action, often require responsible decision-making with incomplete or unreliable information.

These statements may seem more meaningful when rephrased as questions:

1. How does the student learn to be comprehensive responsive, selective, and decisive in his approach to patient care?
2. How does he learn to distinguish between necessary risks and unnecessary ones?
3. How does he recognize the important details from trivial ones, and distinguish the efficient approaches

from the less efficient ones?

4. How does he know when he has enough information to make a decision?

The person who would use programmed instruction in an attempt to teach patient management cannot avoid facing these questions seriously and looking for usable answers. These answers are, at best, tentative and incomplete.

Skill in clinical problem solving can be considered as having three special attributes:

1. Facility in handling complex, conflicting probability estimates.
2. Development of unique, personal strategies for problem solving.
3. Maintenance of an open approach to inquiry.

1. Facility in handling probability estimates. Almost every clinical decision which requires "experience" or "judgment" can be thought of as a probability estimate involving conflicting data. Whether the decision involves an item of history taking, or of physical examination, or of laboratory work, it must be made after a consideration of factors such as the following (the list is incomplete and the items in it are not mutually exclusive):

Table I

LIST OF FACTORS WITH JUDGMENTS

JUDGMENT		FACTORS		JUDGMENT
low	←	reliability	→	high
incomplete	←	data completeness	→	complete
absent	←	confirming data	→	plentiful
high	←	risk	→	low
low	←	benefit	→	high
random	←	sequence	→	ordered
rare	←	incidence	→	frequent
trivial	←	consequence	→	serious

Sometimes only one factor is involved in making a decision. It can be plotted on one axis.

FIGURE 1

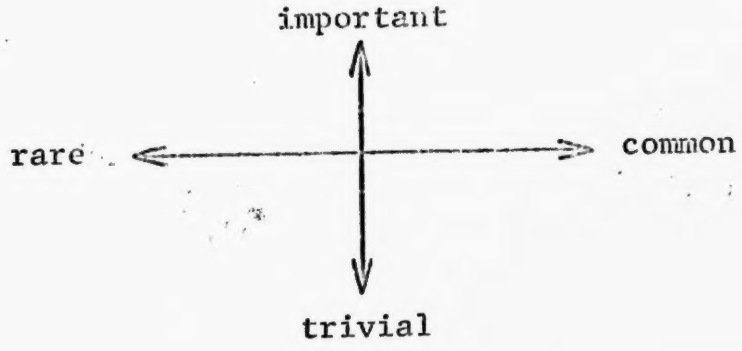
ONE FACTOR DECISION

low risk ↔ high risk

Sometimes two factors must be considered which, in the abstract, have no correlation with each other and could be plotted as independent variables.

FIGURE 2

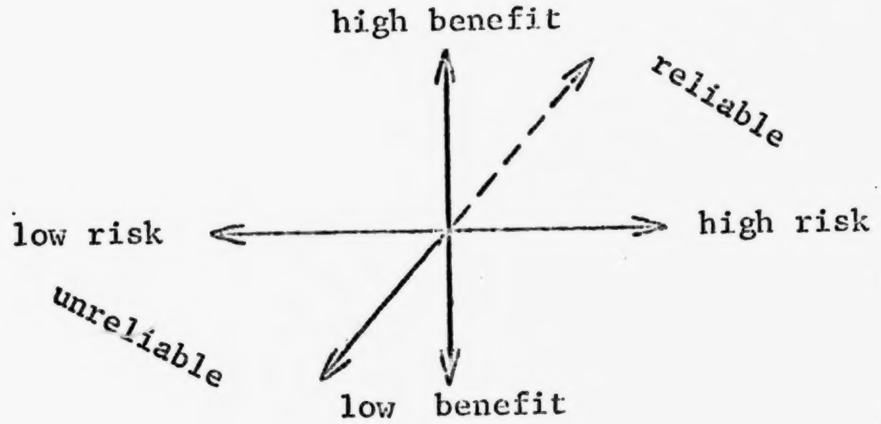
TWO FACTOR DECISION


important
rare
common
trivial

In some decisions, there may be three independent variables. For a given clinical decision, they could be plotted in three dimensional space.

FIGURE 3

THREE FACTOR DECISION

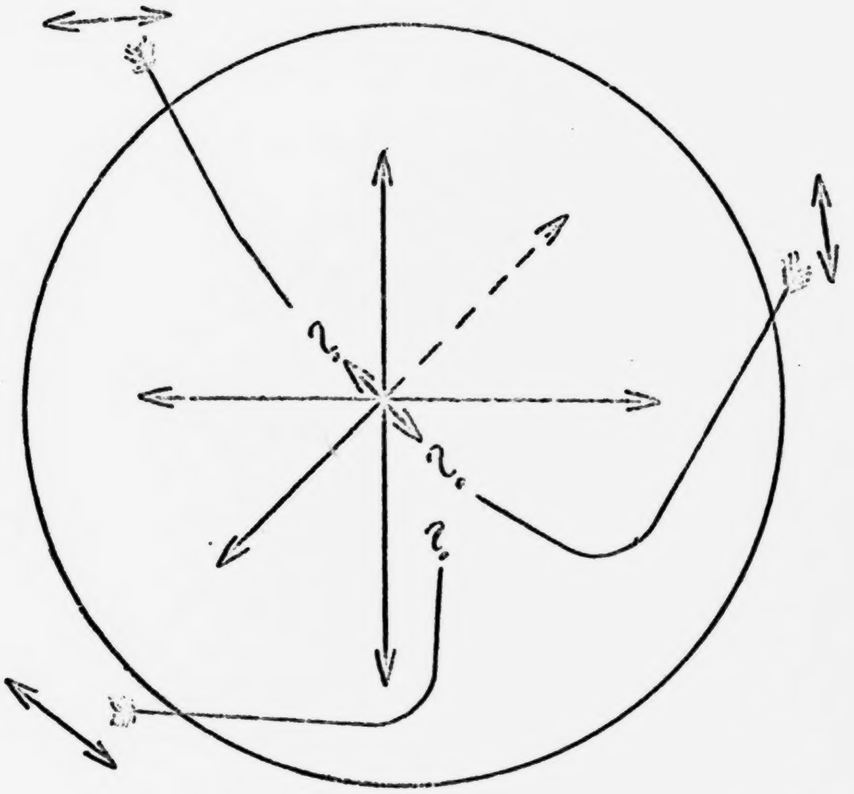

high benefit
reliable
low risk
high risk
unreliable
low
benefit

In most clinical decisions, however, the number of independent and interdependent factors or variables is more than three. Skilled clinicians handle questions involving multiple simultaneous independent variables as a matter of routine and with few signs of discomfort.

Perhaps it is just as well that they seldom attempt to illustrate their decisions graphically, because to do so requires the use of multi-dimensional space. Each independent factor requires a dimension at right angles to all the other dimensions.

FIGURE 4

SIX FACTOR DECISION



Six factors in multi-dimensional space?

It is a comfort to realize that many clinicians and computers resemble each other in sharing an ability to work efficiently to solve problems in multi-dimensional space, and also in sharing an inability to visualize the process. A clinician in evaluating one patient may make a hundred or more complicated data processing efforts, each of which involves multi-dimensional decision making.

2. Development of unique personal strategies. The student, in learning the clinician's skill in making rapid, largely unconscious probability estimates, has to develop these skills in his own unique way. Clinical problem solving, as has been emphasized, requires skills in inquiry and discovery. Learning of clinical problem solving is principally "discovery learning." Much recent theoretical work in this area has come from Dr. Jerome Bruner of the Center for Cognitive Studies at Harvard University. He has written:

> "It is only through the exercise of problem solving and the effort of discovery that one learns the working heuristic of discovery, and the more one has practice, the more likely is one to generalize what one has learned into a style of problem solving or inquiry that serves for any kind of task one may encounter.... I have never seen anybody improve in the art and technique of inquiry by any means other than engaging in inquiry....The principal problem of human memory is not storage, but retrieval. The key to retrieval is organization or, in even simpler terms, knowing where to find information and how to get there....

Dr. Bruner summarizes:

> "The very attitudes and activities that characterize 'figuring out' or 'discovering' things for oneself also seem to have the effect of making material more readily accessible in memory."

To translate Dr. Bruner's hypothesis to the practical problems of teaching clinical problem solving, the student is given practice cases to solve and develops his unique personalized strategies for problem solving. He improves his efficiency in retrieving information from his own storage system. In teaching clinical problem solving, one must help him develop his skills by offering him practice cases that are representative, realistic, and properly sequenced.

3. Maintenance of an open approach to inquiry. If the student's experience in problem solving is adequate in quantity, quality, and representativeness, his personalized problem solving strategies will include characteristics which one may hope will be maintained as lifelong habits of inquiry. These include the following:

1. Comprehensiveness
2. Responsiveness
3. Selectiveness
4. Decisiveness

The transformation of an inefficient or incompetent information-gatherer into a clinician who is skilled in the art of inquiry is a learning process. Programmed cases, if they are to help bring about this transformation, should be planned and organized into a pattern which permits effective learning. Such a planned sequence might differ rather sharply from the unplanned, random sequence of patients seeking care at a hospital emergency room or clinic.

SUMMARY

1. Problem solving is complicated, but may be divided into two stages:
    a. Inquiry
    b. Problem resolution

2. Problem solving requires many skills, such as:
    a. Facility in handling probability estimates
    b. Unique, personal strategies of problem solving
    c. Open approach to inquiry

3. Problem solving or inquiry skills are learned by practicing inquiry.

4. Skilled problem solving behavior has several characteristics:
    a. Comprehensiveness
    b. Responsiveness
    c. Selectiveness
    d. Decisiveness

REFERENCES

1. Bruner, J. S.: "The Act of Discovery," Harvard Educational Review, Volume Thirty-Three, Number 1, Winter 1963. Pages 124-135.

DIRECTIONS

The next step in the course will be to work through two programmed cases. These cases resemble each other in that they both are short, both are introductory, and both were prepared by authors who had had little prior experience in writing programmed cases. The two cases represent a contrast in subject matter, purpose, approach to the subject, and format. Problem 1 is the first of a series of 35 programmed cases dealing with gynecologic tumors; Case II is the second of a series of six programmed cases dealing with allergic problems in children.

III. PROBLEM 1

A 25-year-old registered nurse comes to you for premarital examination and advice. Your patient appears to be in excellent general health. Your history and general physical examination, which are both complete, show nothing abnormal except in the pelvic examination.

There is one positive finding: a solid spherical mass 3 cm in diameter protruding from and fixed to the anterior surface of the uterus about halfway between the cervix and the top of the fundus. All other aspects of the pelvic examination are normal for a nulligravida.

After the completion of your examination, what advice or information would you give to your patient with regard to this mass which you detected?

Write your answer, then turn to PAGE 2a.

From the list below, please mark the answer which corresponds most closely to your own, then turn to the PAGE indicated.

☐ Don't mention the mass at this visit; just reassure her, answer her questions and give advice with regard to sexual relations and contraception as indicated. PAGE 3a

☐ Tell her that she is in excellent health, that like many other women, she has a small fibroid on her uterus which will probably cause no trouble, and that she should always have annual or semi-annual pelvic examinations. PAGE 4a

☐ Tell her that she has a tumor on her uterus which is probably benign but should be removed surgically in the near future, otherwise it will continue to grow and will eventually interfere with pregnancies or produce symptoms which will necessitate hysterectomy. PAGE 5a

☐ Inform the patient that she has a tumor on her uterus, that surgical removal is the only means of being certain of the diagnosis, and that in order to rule out the possibility of cancer (especially leiomyosarcoma), you advise exploratory laparotomy and removal of the tumor as soon as possible. PAGE 6a

☐ None of the above options. PAGE 7a

DON'T MENTION THE TUMOR AT THIS VISIT GIVE HER THE ADVICE SHE CAME FOR

This is a commendable approach with regard to protecting your patient's peace of mind. It has two drawbacks:

1. Patient may already know she has the tumor, in which case your failure to inform her of your findings is certain to raise doubts in her mind at least with regard to: 1) your competence as an examiner, and 2) your honesty in dealing with her.

2. The tumor is almost certainly a neoplastic growth which should not be ignored. If she gets no help from you with regard to this tumor, she may wind up in the care of another physician who might have an entirely different solution for the problem.

Please return to PAGE 2a and choose another answer.

TELL THE PATIENT SHE HAS A FIBROID
HAVE HER RETURN FOR REGULAR EXAMINATIONS

This is a straight-forward approach which would not alarm the patient any more than is necessary, but which would provide her with enough information to put the burden on her to return for regular follow-up care.

When the patient returns to you some months later, what symptoms or findings would indicate to you that intervention might be necessary?

Write your answer, then turn to PAGE 8a.

4a

ADVISE PROPHYLACTIC SURGERY NOW IN ORDER TO AVOID SYMPTOMS REQUIRING HYSTERECTOMY LATER

The prediction that the fibroid will continue to grow and will produce symptoms later is probably true. It is also quite probable that the patient's uterus contains seedling fibroids in addition to the one which can be palpated at present. Thus, her long-range reproductive future might be very little altered by the immediate removal by myomectomy of one small asymptomatic fibroid.

If the patient elected to ignore your advice and offered instead to return to you at a later date for re-evaluation, what symptoms or findings would suggest to you that intervention might be indicated for reasons other (or better) than prophylaxis?

____

____

Write your answer, then turn to PAGE 8a.

EXPLORATORY LAPAROTOMY AND REMOVAL OF THE TUMOR

With this approach, the odds are definitely in your favor. The chances are better than 100 to 1 that the pathologic diagnosis would be as follows:

UTERINE LEIOMYOMA

You could assure the patient that she didn't have cancer, but could you assure yourself that the operation was necessary? Most clinicians in a case such as this would do no more at this time than to follow the patient at regular intervals, and let their indications for surgery be based on symptoms or findings such as

Write your answer, then turn to PAGE 8a

NONE OF THE OPTIONS GIVEN

Any additional comments?

Your response may be helpful in further revisions of this programmed text. For the present, however, please return to PAGE 2a and choose one of the other options listed.

RAPID ENLARGEMENT OF THE TUMOR
PAIN OR TENDERNESS
ABNORMAL BLEEDING

In a young married woman, rapid enlargement of a uterine fibroid may occur as a result of malignant change into a ______________________.
(name the tumor)

More commonly, however, rapid enlargement accompanies ______________________________.

Go on to PAGE 9a.

8a

LEIOMYOSARCOMA
PREGNANCY

When your patient returns to you, it is six months since her marriage and two months since her last menstrual period. Your patient complains of the subjective symptoms of early pregnancy. On pelvic examination the cervix is somewhat blue, Hegar's sign is positive, the uterus is slightly enlarged, with the fibroid being almost 5 cm in diameter. It is felt to be located in the lowermost portion of the fundus anteriorly.

What advice could you give this patient with regard to the ~~a~~effect of this tumor upon the course of pregnancy and upon the process of labor and delivery?

Write your answer, then turn to PAGE 10a.

THE TUMOR WILL PROBABLY CAUSE NO TROUBLE WITH PREGNANCY, LABOR, OR DELIVERY

Uterine fibroids as a complication of pregnancy are discussed in detail in most obstetrical textbooks. A general review of fibroids, their diagnosis and management may be found in

FRAMES 366-421 in Essentials of Gynecologic Oncology.

Uterine sarcomas, including leiomyosarcoma, are discussed briefly in FRAMES 517-522 in the same text.

Please review these frames if you wish to; otherwise, proceed to the next problem.

10a

IV. CASE II

Susianne, fourteen month old white female, was referred with a diagnosis of asthma.

The history revealed that the child had had occasional episodes of cyanosis, since early infancy, accompanied by a cough and rattling in the chest.

The referring physician had heard wheezing at a time when the child was cyanotic.

For history as obtained from
the mother, see page 26.

HISTORY

The mother was German and could not speak English; the grandmother, who could speak only English, had not seen the child until one month earlier when she can to this country.

All that could be gathered was that the baby had been very sick shortly after she was born and had turned blue several times, especially after exertion such as eating.

For physical findings, see page 27.

PHYSICAL FINDINGS

A healthy appearing but irritable blond, blue-eyed white female.

50th percentile Ht. and Wt.; T. 37.4°C rectally; P 110/min., R 56/min.; head circumference normal.

Not walking, but pulls up and stands alone.

Lungs clear to P & A. No murmurs.

Remainder of examination unremarkable, including neurological.

What is your differential diagnosis?

Turn to page 28.

DIAGNOSTIC STUDIES

Of the following items, only the ones which correspond to the code numbers on the right apply to this particular patient.

1. Normal. Seen by cardiologist who found no evidence of heart disease.
2. 6 mEq/L.
3. Normal.
4. Hgb. 12.7 gm%
   Hct 37%
   WBC 7,900
   Segs 32%
   Lymphs 58%
   Monos 5%
   Eos 5%
5. Negative, including PKU.
6. Not done.
7. See page 30.
8. Negative.
9. Negative.
10. Slight increase in bronchial markings. No cardiac enlargement. (See page 30 a)
11. See page 30 a.
12. Not done. See page 30 a for chest film and barium swallow.
13. No sputum could be obtained. N P culture: alpha Strep, Neisseria.

⇩ START HERE !

Obtain the information you wish, then turn to page 29 to give your diagnosis.

___CBC	4
___Urinalysis, including PKU	5
___Na, K, Cl, CO_2	6
___PA & lat chest x-ray	10
___PPD	8
___Sweat Cl	2
___Allergy scratch tests	7
___EKG	1
___Sputum culture	13
___Barium swallow	11
___EEG	3
___Blood for methemoglobin	9
___Cardiac series	12
___Nasopharyngeal culture	13

Turn to page 29 to give your diagnosis.

DIAGNOSIS

Please write your tentative diagnosis.

____

____

____

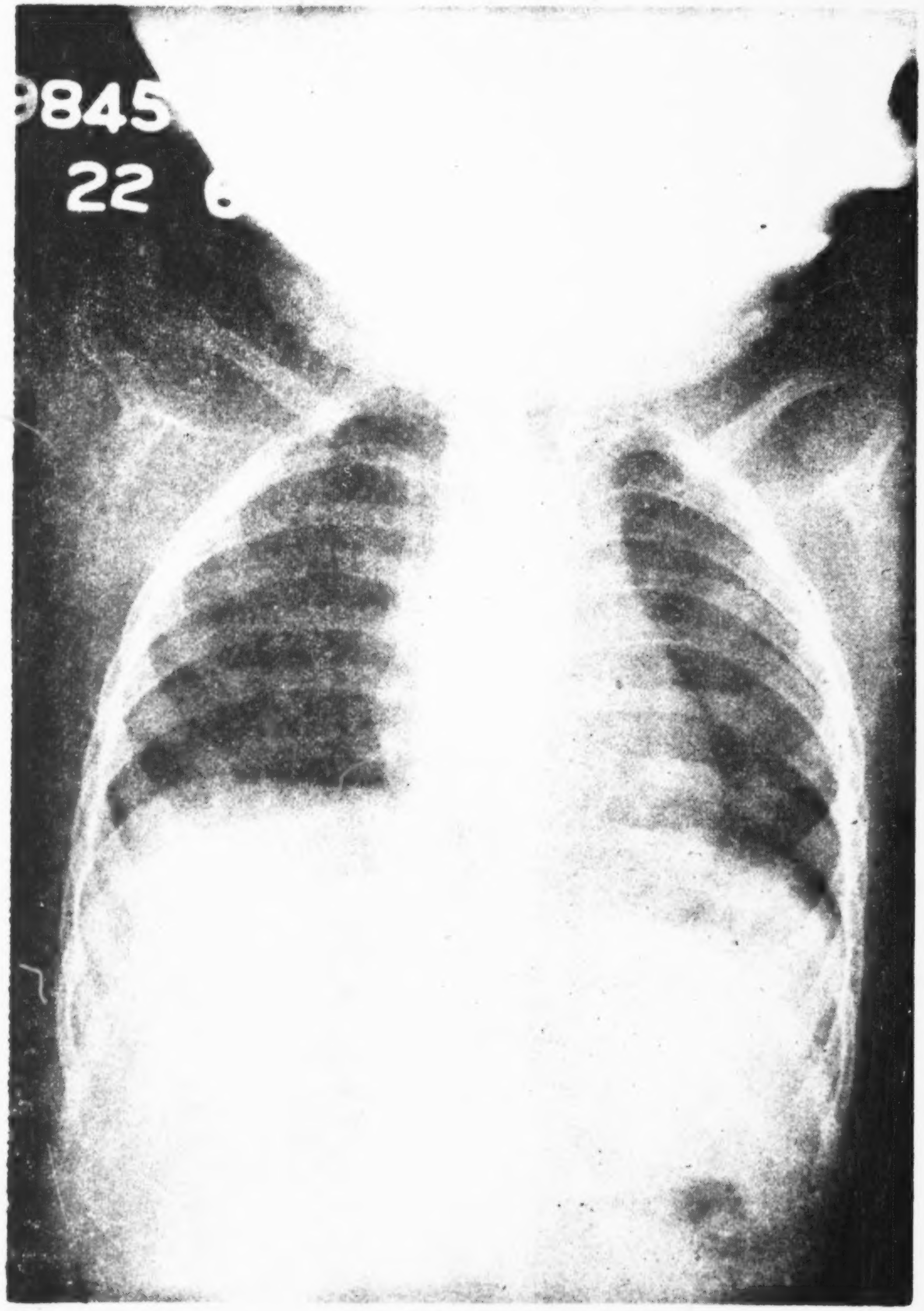
____

Turn to page 31.

SCRATCH TESTS

House dust	1+	Mixed Trees	0
Kapok	0	Elm	0
Feather mix	?	Oak	0
Mattress dust	?	Walnut	0
Cotton linter	0	Pecan	0
Tobacco smoke, ash	1+	Mixed grasses	0
Orris root	0	Mixed ragweed	0
Dog hair	0	Alternaria	?
Cat hair	0	Hormodendrum	0
Horse hair	0		
Animal glue	0	Egg	0
Sheep wool	0	Wheat	0
Pyrethrum	?	Chocolate	0
Control	0	Cow's Milk	?

Return to page 28 and complete your studies.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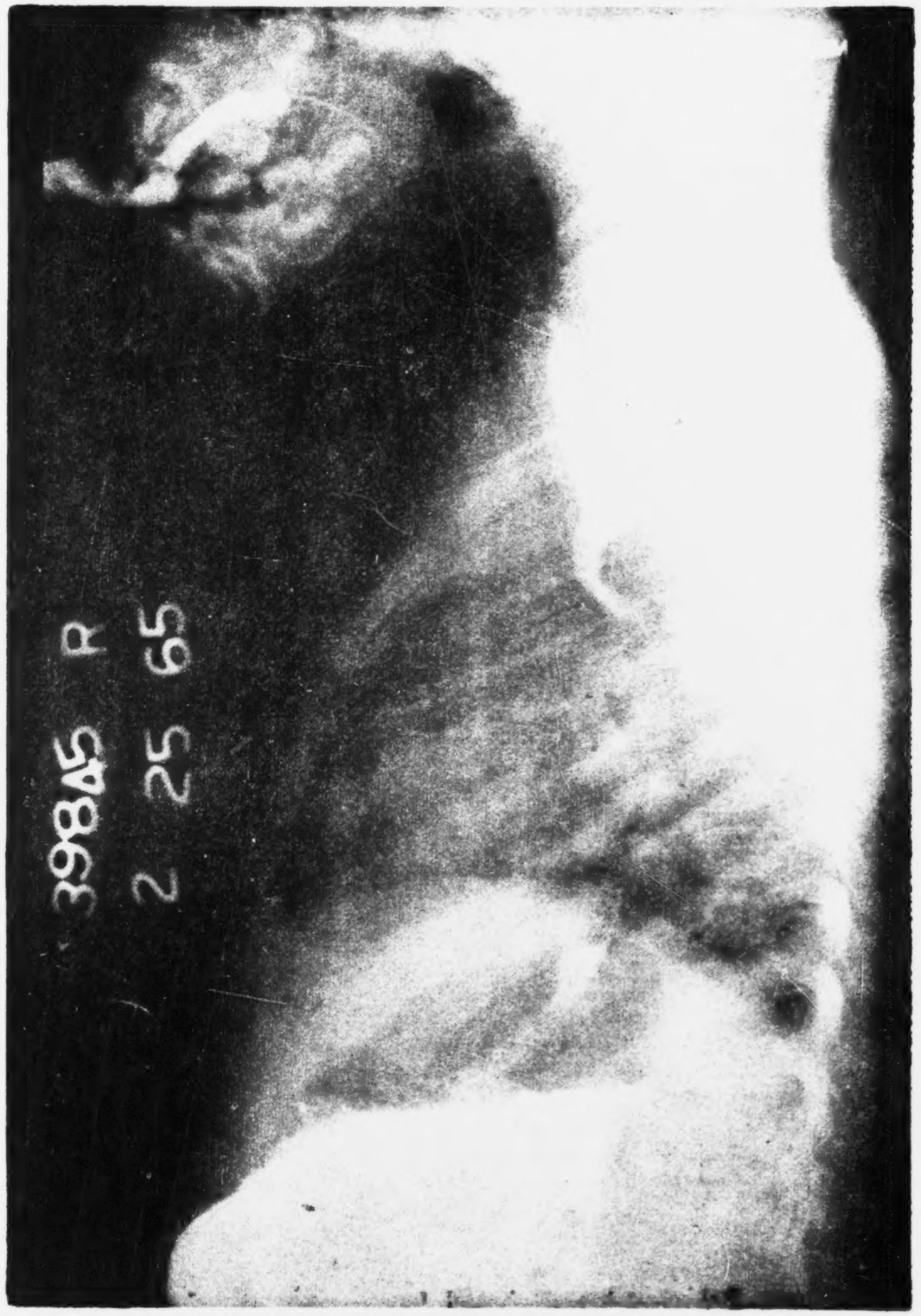

39845 R
2 25 65

DIAGNOSIS

Of the following items, only the ones which correspond to the code number on the right apply to this particular patient.

1. This is characterized by a much more marked eosinophilia than is present in this patient and is generally transient. Make another choice.

2. There is no real evidence of heart disease. Make another choice.

3. Check the sweat chloride level, page 28, against normal values. Make another choice.

4. "Chronic bronchitis" is a term reserved for persistent disease of the bronchial tubes, usually accompanied by significant changes in the bronchial epithelium. This is rare in young children, except those with cystic fibrosis. It is common in the over-40 age group, and usually related to bronchial epithelial change resulting from inhaled air pollutants--primarily cigarette smoke--over an extended period of time. Make another choice.

5. This is a term reserved for a specific illness characterized by acute onset of wheezing in a child typically under two, fairly unresponsive to epinephrine and seldom recurrent. It is usually considered due to Hemophilus or viral infections. Make another choice.

6. The child was placed on regular bronchodilators and a limited diet, and dust control program initiated at home. She returned in six weeks, unimproved, with history of vomiting frequently when coughing. Make another choice.

7. See page 32.

8. See page 35.

⇩ START HERE!

Check the diagnosis or diagnoses which you strongly consider. Then refer to the corresponding code numbers in the column on the left for this information.

___Asthma................6

___Chronic bronchitis.............4

___Bronchiolitis..........5

___"Vascular ring"........7

___Cystic fibrosis........3

___Congenital heart disease................2

___Loeffler's syndrome....1

___None of the above......8

VASCULAR RING

The filling defect in the esophagus probably results from extrinsic compression of the posterior wall of the esophagus by an anomalous blood vessel.

By what mechanisms could this cause respiratory problems?

Turn to page 33.

The esophageal obstruction may cause vomiting and aspiration of food or mucus which causes episodes of choking, wheezing, coughing and even cyanosis in infancy.

The swallowing mechanism may even be affected. Rarely the vessel might cause actual compression of the trachea.

Often, these anomalies do not produce symptoms at all. A barking cough is a common symptom, not present in this child.

What other features of her case are suggestive that Susianne does not have asthma, or that it is not the whole problem?

____

____

____

____

____

Go to page 34.

Features of this case which were not typical of childhood asthma were:

1. Presence of symptoms from birth
2. The cyanotic episodes which are uncommon in asthma except in severe attacks.

Susianne is being followed with plans for angiography to determine the exact type of anomaly and the feasibility of corrective surgery if symptoms indicate the need for it.

Her mother, whose English has improved considerably, tells us that her mother had asthma as well as several other persons in the family; so Susianne may indeed have asthma, superimposed on her other problem.

Go on to the NEXT CASE.

NONE OF THE ABOVE

Please write your reasons for not choosing any of the listed items.

____

____

____

____

Thank you. These comments will be used in future revisions. Please return to page 31 and make another choice.

DISCUSSIONS IN GROUPS OF SIX

One person in each group of six will be designated as spokesman for the group. You will have six minutes for discussion within your group. During this six minutes, each member of the group should express his initial reaction to any aspects of the opening speech or of either of the cases. At the conclusion of six minutes, each spokesman will have a minute in which to present the viewpoint of his group. When the last spokesman has presented his summary, there will be a few remaining minutes for open discussion, questions or comments from the floor.

V. STRATEGIES OF TEACHING INQUIRY SKILLS USING PROGRAMMED CASES

Medical students during clinical clerkships and house officers during their internships and residencies work with real patients who confront them with real clinical problems. Whether they see patients in a broad medical field or a narrow clinical specialty, they are faced with problems in a random sequence. From the learner's standpoint, a random sequence of patients probably resembles a textbook with the pages and chapters in a random order. Certainly, learning takes place, but the cost in terms of frustration and inefficiency may be somewhat higher than necessary.

The person who is preparing programmed case materials has the opportunity to arrange his cases as he pleases. He may choose a random sequence, or he may even camouflage his efforts so that in the end, his carefully planned sequence appears to the learner as a random arrangement full of surprises.

Appropriate problem solving behavior requires the following attributes:

1. Comprehensiveness in the approach

2. Responsiveness to new information as it evolves
3. Selectiveness in the acquisition of further information
4. Decisiveness, a willingness to take action on the basis of available information.

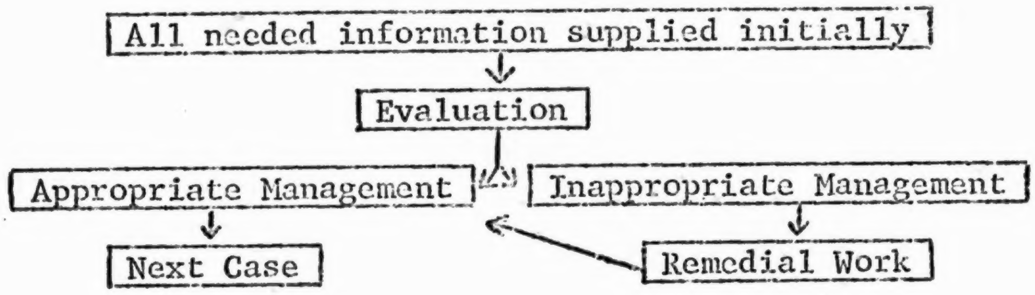
The purpose of this presentation is to show how programmed cases can be arranged to encourage the learner to develop these attributes.

Clinical problem solving requires special skills in inquiry as well as in answer finding. It is appropriate to divide the teaching of these skills into separate phases. The divisions, however, are arbitrary and are useful only to illustrate the sequence in which new material may be introduced, phase by phase. In a completed sequence of programmed cases, the phases all overlap, run concurrently, and blend into each other with no clear distinctions.

PHASES

Phase I. The first phase begins with the mathetical assumption that the proper place to start the learning process is at the end. Learners of clinical problem solving seem to be more interested in answers than in questions. "Don't confuse me with the facts, just tell me the answer; how do I handle the problem?" In teaching clinical problem solving by means of programmed instruction, the proper starting point is problem resolution, rather than inquiry. The students are asked to find answers for problems in which all the necessary information is supplied. This type of case presentation may be diagrammed as follows:

FIGURE I


All needed information supplied initially
Evaluation
Appropriate Management
Inappropriate Management
Next Case
Remedial Work

PHASE I

DECISION WITH COMPLETE DATA

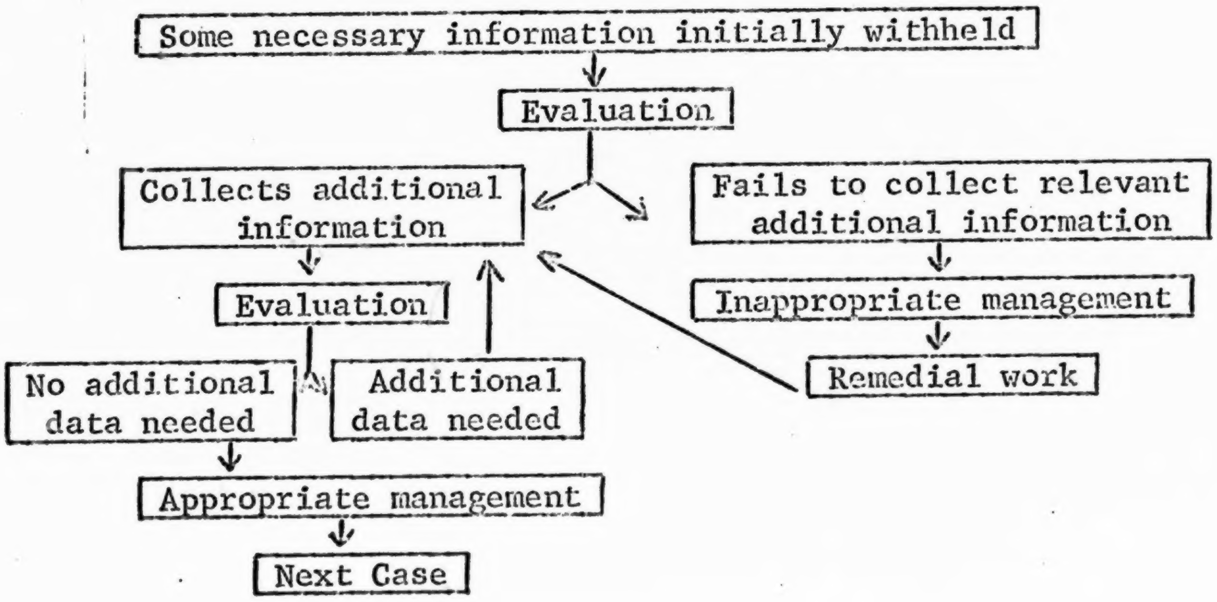
In effect, the student is asked, "Here is the problem, what is your answer?" This is the simplest type of case presentation since it is a single phase process. Within this framework, however, a series of problems of increasing complexity can be developed. The student learns that appropriate management requires him to evaluate carefully all the information presented to him and relate this to his fund of medical knowledge. The initial protocol for the case can be brief, or it can present a detailed history and physical examination and large amounts of pertinent and irrelevant laboratory work, all of which the learner must evaluate critically before he can develop a plan of management, which also can be quite complicated. The simpler cases usually present only relevant information; more complicated ones mix the relevant information with the irrelevant. Therefore, in the first phase of the conditioning process, the student must distinguish between:

1. Relevant information
2. Irrelevant information

and must then take appropriate action based on his evaluation of the relevant information. The change from short simple problems to complex sophisticated ones should be developed gradually over a series of case presentations so that the student is not caught by surprise and frustrated by a case which is too demanding for him.

Phase II. In the second phase of the conditioning process, he must learn to respond to the absence of pertinent information, which can be diagrammed like this:

FIGURE 2


Some necessary information initially withheld
Evaluation
Collects additional information
Fails to collect relevant additional information
Evaluation
Inappropriate management
Remedial work
No additional data needed
Additional data needed
Appropriate management
Next Case

PHASE II

DISCOVERY OF ABSENT INFORMATION

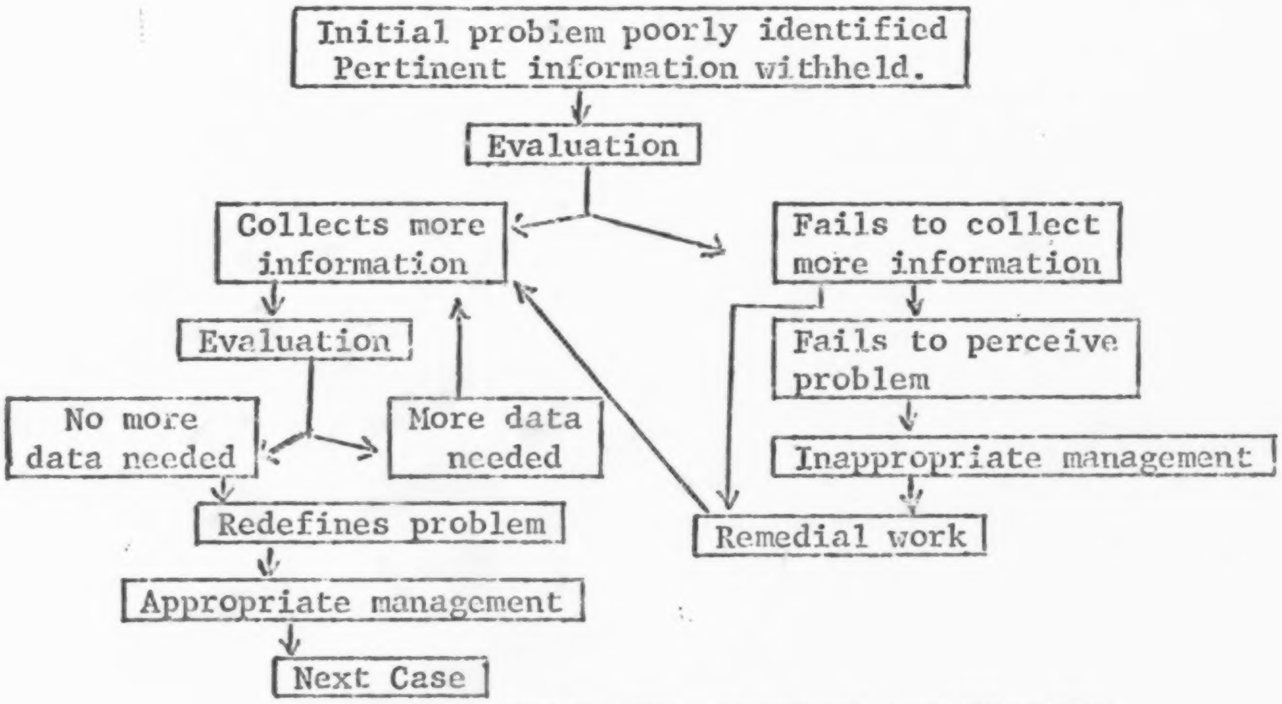
The learner must evaluate the information given him initially and then decide what additional information he needs in order to take appropriate action. The student must make three distinctions:

1. Relevant information
2. Irrelevant information
3. Missing information

Depending upon how the student has evaluated the information given him initially, the missing information he collects from the data gathering sections of programmed cases may be relevant or irrelevant. If he collects and evaluates relevant information, he may proceed rapidly towards a solution for the problem. If he flounders helplessly in the collection of irrelevancies, it becomes apparent that he has not yet learned to distinguish the relevant from the irrelevant and he needs additional or remedial work from the first phase.

Phase III. At the end of the second phase, the student should have learned how much and what additional information he needs to define a problem with precision necessary for appropriate management. In the third phase of the conditioning process, the student is asked also to identify or discover the problem. The process may be diagrammed like this:

FIGURE 3


Initial problem poorly identified
Pertinent information withheld.
Evaluation
Collects more information
Fails to collect more information
Evaluation
Fails to perceive problem
No more data needed
More data needed
Inappropriate management
Redefines problem
Remedial work
Appropriate management
Next Case

PHASE III DEFINING THE PROBLEM

Initially the patient's difficulties are poorly identified or concealed altogether. The learner, in developing his habits of inquiry, must add another category to his discriminations:

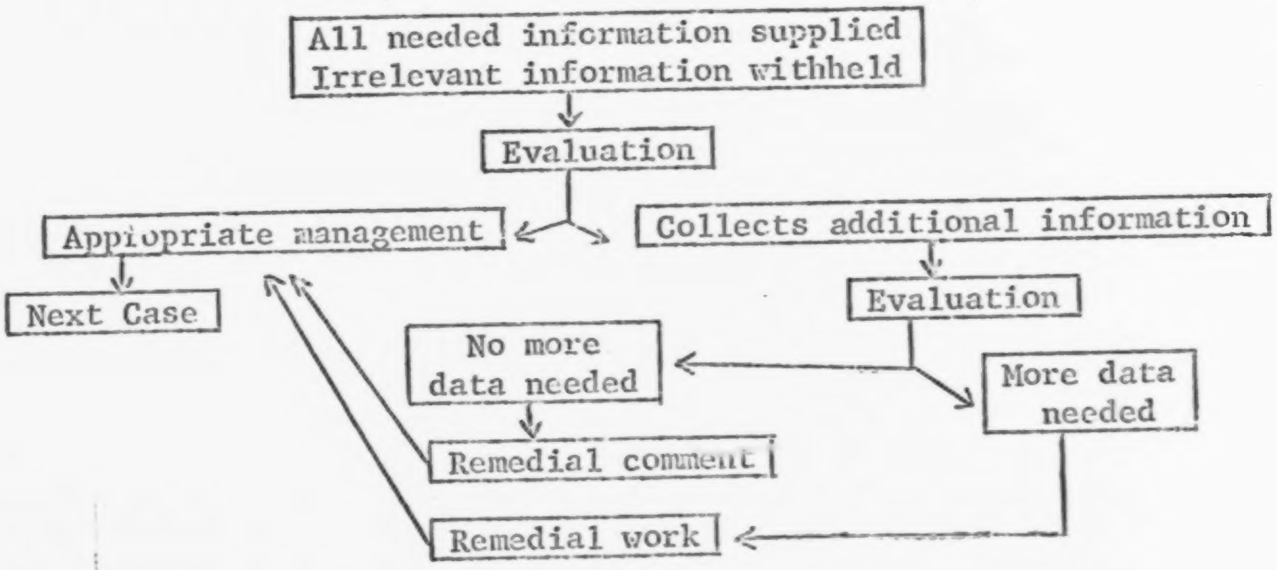
1. Relevant information
2. Irrelevant information
3. Missing information
4. Survey information

He is asked to make use of appropriate portions of history, physical examination, and laboratory work in looking for problems which initially may be unsuspected. He is asked to develop habits of obtaining survey or screening information and to develop also responsiveness to positive findings from his survey. He must follow up each lead and modify his plan of management for the patient in accordance with his findings. At the conclusion of this third phase of the process, the student should recognize that the patient's initial statement of the problem is only a starting point for investigation, and may represent only a small portion of the problems which must be recognized, defined and resolved.

The three strategies, Phases I, II and III, for teaching inquiry that have thus far been discussed all tend to emphasize the need for responsible, comprehensive information gathering and tend to deemphasize the importance of efficient, decisive action in patient management.

Phase IV. If all programmed cases went no further than Phase III, they would give the false impression that the ideal clinician is invariably an obsessive-compulsive information collector. Certainly there are times when this kind of behavior is appropriate. There are other times, however, when compulsive information-gathering must be bypassed in favor of decisive action. This can be diagrammed as follows:

FIGURE 4


All needed information supplied
Irrelevant information withheld
Evaluation
Appropriate management
Collects additional information
Next Case
Evaluation
No more data needed
More data needed
Remedial comment
Remedial work

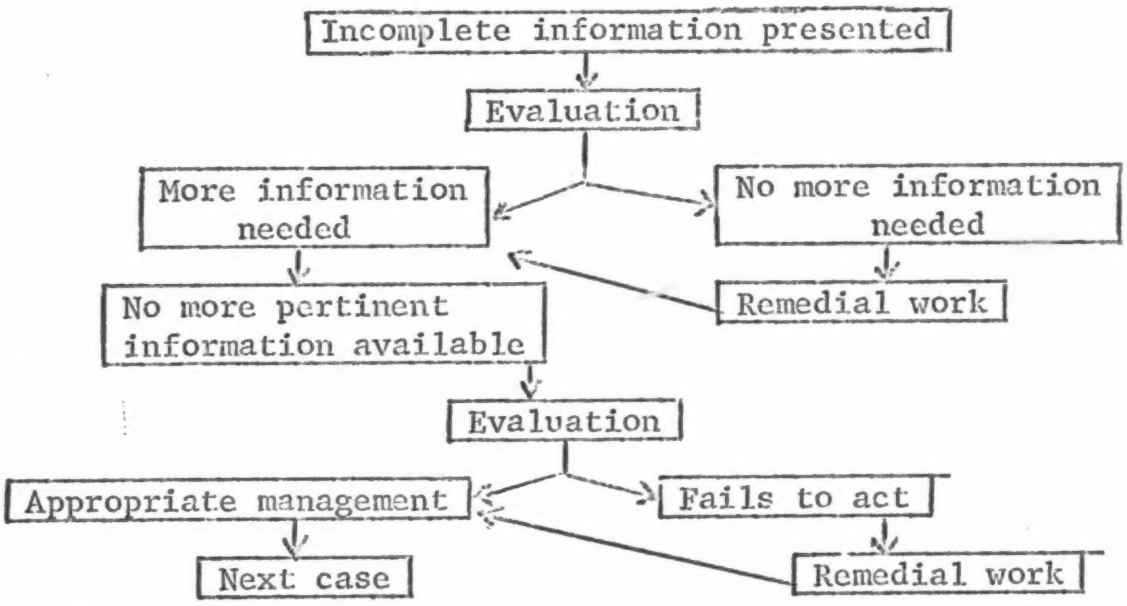
PHASE IV

DECISIVE ACTION

In effect, the student is asked, "Can you recognize immediately how much information is enough, or must you waste time and effort in collecting unnecessary information?" Cases designed to teach this discrimination have the same essential structure as the simple puzzle solving cases in Phase I; in addition, they carry as unnecessary baggage the data gathering frames added in Phases II and III to give practice in the art of inquiry.

Phase V. At this point the student should have become adept at evaluating the completeness and relevance of the information he needs to investigate the patient's difficulties. In many clinical problems, however, action must be taken on the basis of incomplete information. The learner must learn to make vital decisions based on probability estimates which in some instances must be based upon very inadequate information. Up to now, most of the conditioning has moved in the direction of requiring him to be comprehensive, responsive, and selective in his collection of information, and yet he must also learn to be decisive when information he needs is unavailable to him. This is diagrammed like this:

FIGURE 5


Incomplete information presented
Evaluation
More information needed
No more information needed
Remedial work
No more pertinent information available
Evaluation
Appropriate management
Fails to act
Next case
Remedial work

PHASE V

DECISIVE ACTION WHEN INQUIRY IS FRUSTRATED

Here the question seems to be, "Can you take action in the patient's interest and accept responsibility for uncertainties which you have been unable to evaluate?" A series of cases in this category is designed to teach the student to look at the information he has, not only from the standpoint of completeness and certainty, but also to recognize instances where the need for decision making requires action in spite of incompleteness and uncertainty. In short, when inquiry has been frustrated, can the student resolve the problem anyhow?

EMPHASIS ON INQUIRY TRAINING

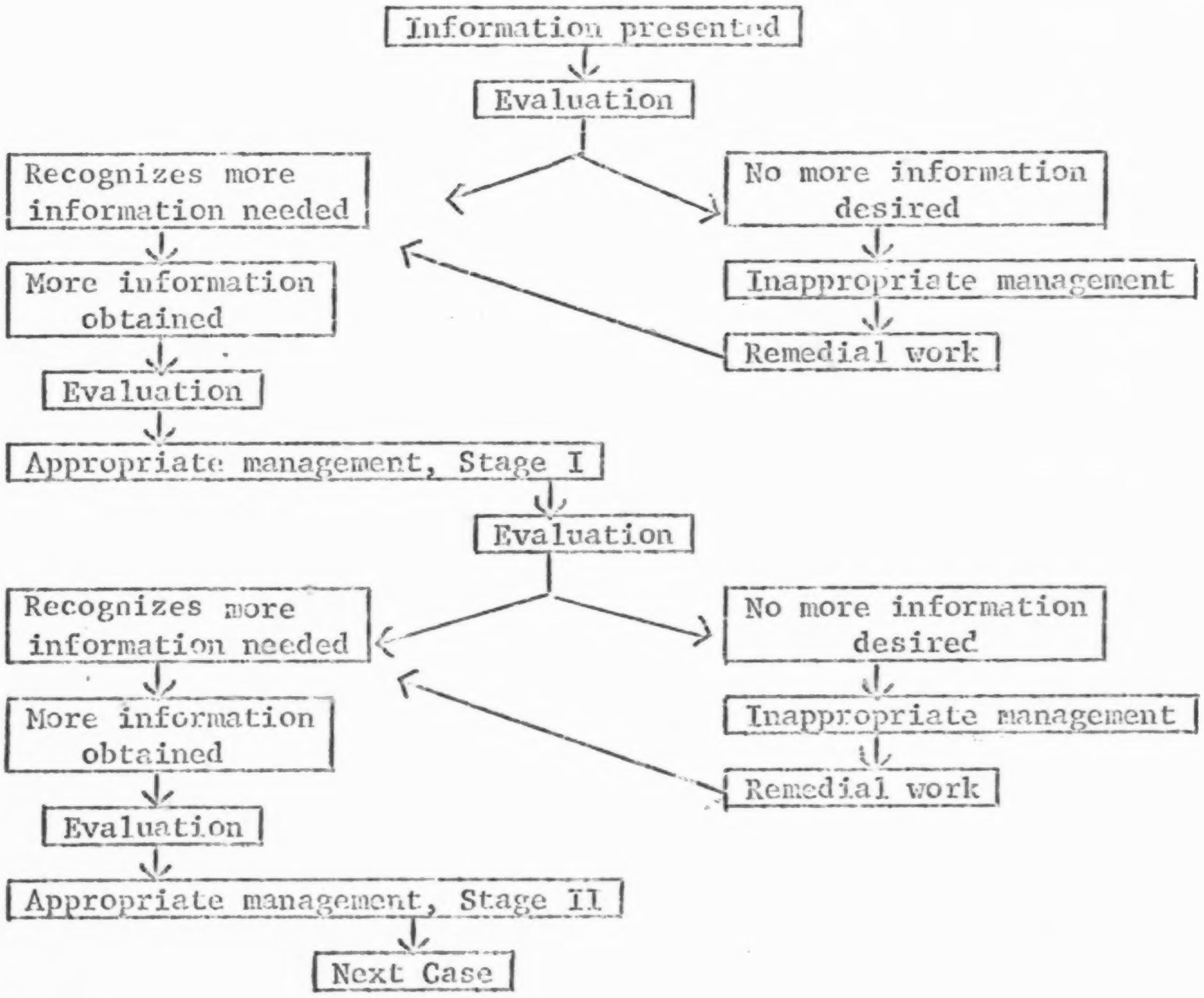
Programmed case materials designed for undergraduate medical students tend to emphasize the development of skills in inquiry and diagnosis, rather than skills in therapy. This emphasis may be appropriate in helping to correct the de-emphasis of inquiry in the medical school curriculum. In conventional teaching, even when the case study method is used, as in rounds, clinicopathological conferences, etc., the participation of students in learning is limited to the Phase I level. Furthermore, conventional methods of testing tend to ignore the art of inquiry altogether. These deficiencies in the curriculum may have a bearing on the findings of Peterson[1] and Clute [2] who noted that the most striking deficiency of physicians in general practice was their inadequacy of inquiry, their failure to obtain essential information from history, physical examination and laboratory work.

MANAGEMENT TRAINING

The potential usefulness of programmed cases in teaching a wide spectrum of inquiry skills is still largely unexplored. The teaching of management skills, like the teaching of inquiry skills, requires similar explorations. Undoubtedly, it can be divided into phases.

A two-stage management problem could be diagrammed like this:

FIGURE 6


Information presented
Evaluation
Recognizes more information needed
No more information desired
More information obtained
Inappropriate management
Remedial work
Evaluation
Appropriate management, Stage I
Evaluation
Recognizes more information needed
No more information desired
More information obtained
Inappropriate management
Remedial work
Evaluation
Appropriate management, Stage II
Next Case

TWO STAGE MANAGEMENT

In this illustration, the student, after completing the usual stages of inquiry, is asked to formulate therapeutic trials. Each stage of management requires the collection and evaluation of further information before the next stage in management can be formulated appropriately.

Once case presentations reach this point of complexity, the possible branches and ramifications of management problems are endless, especially if cases are programmed for computer presentation rather than simple paper and pencil formats. Technologies have been developed to permit the programmed presentation of the most complex problems, and strategies of programmed instruction are available to teach almost any desired pattern of problem solving behavior, from "shooting from the hip," to information-gathering. The limiting factors are human and require that the teacher and the student work together.

> "What do you want him to learn?"
> "How far into this jungle will he
> travel in order to learn it?"

SUMMARY

Students of problem solving can learn to be comprehensive, responsive, selective, and decisive through practice in solving problems. The types of problems requiring inquiry can be classified and presented in the following sequence:

Phase I--All information supplied initially.

Phase II--Some necessary information initially withheld.

Phase III--Initial problem mis-identified and pertinent information withheld.

Phase IV--All needed information supplied, irrelevant information withheld.

Phase V--Essential information presented, desirable additional information unavailable.

A programmed approach permits the student to practice the solving of a wide variety of problems which require inquiry. This variety is not available to the student with conventional group instruction.

REFERENCES

1. Peterson, O. L., M.D. "An Analytical Study of North Carolina General Practice," The Journal of Medical Education. Chicago, Illinois: Association of American Medical Colleges, December, 1956, Vol. 31, No. 12.
2. Clute, Kenneth F. The General Practitioner. Toronto, Canada: University of Toronto Press, 1963.

DIRECTIONS

The next step in this course will be to work through two more programmed cases, both of which are taken from the two contrasting series. Case III is a longer and more complicated problem taken from the series in pediatric allergy. Problem 10 is the tenth in a series of 35 cases dealing with gynecologic tumors. It is the introductory case in a series of cases which deal with the diagnosis and treatment of postmenopausal vaginal bleeding.

In working through the oncology cases, you may find that the directions or instructions are inadequate, or on some pages altogether absent. Students who work through the complete set of cases in the proper sequence do not encounter this difficulty because as each new page format is introduced, it is presented with adequate instructions. The instructions, however, are not repeated from case to case. The samples in this workbook, taken from advanced portions of the text, have a minimum of directions often in coded form. If you have any difficulty, we offer our apologies!

Please work through these cases now.

VI. CASE III

Betsy, 15½ years old, a high school sophomore, consults you because she is bothered by "breaking out" in the folds of her elbows and behind her knees, which she has had before.

While she is telling you her complaint, she shows you her arms. There are several reddened moist splotches in and around the antecubital fossae. One area showed some crusting, slight oozing of serous material on the flexor surface. Around the edge of the fossae there is some thickened skin, and the fossae have not tanned as well as the rest of her arms. Wrist on right shows some type of eruption on the flexor surface.

Behind her knees, in the popliteal fossae, the skin is slightly rough in an irregular pattern, normally moist. There are a couple of maculopapular splotches at the lower margins of the fossae, bilaterally.

Check your first step:

___Obtain a detailed past history and family history including questions about the skin. Page 51

___Complete physical examination. Page 52

___Ask some questions about the skin. Page 53

___Do some diagnostic studies. Page 56

___Make a diagnosis. Page 59

HISTORY

Of the following items, only the ones which correspond to the code numbers on the right apply to this particular patient.

1. Does not smoke. Uses some makeup, no hair spray.
2. All given, including smallpox, without problem.
3. Boys, too good grades, sisters! None very serious. Scratches face and arms when upset.
4. Hard to say. Depends more on temperature.
5. None. Breast fed, Similac first year, no wheat, eggs, as precaution.
6. Less in mountains, less at beach. Worse at home.
7. Required penicillin treatment for badly infected skin--Impetigo?--in 2nd grade. Has used white cream or ointment irregularly to control rash.
8. Father's sister had "eczema" as infant. Father had bad attack of skin trouble in Army--said due to wool blankets. Father's mother said to have some "skin allergies."
9. Unrestricted, except for tomatoes.
10. Itching inside nose, throat, ears, often. No asthma. "Hay fever, I guess." Nose stopped up in mornings. "My father says my nose is stopped up more than I realize."
11. Negro, youngest of 4 children, father teaches school.
12. Two sisters and father have nose allergies; mother's sister has hay fever.
13. Chickenpox, measles, 3 d measles, mumps. One episode of otitis media as infant; occ. URI.
14. None known.
15. Adenoidectomy at 5 years.
16. Failing eighth grade.
17. Old house, forced air heat, old wool rugs in living room, hall steps, library. Fireplaces occasionally used. Many old books. Bedroom cluttered. Plastic covered pillow and mattress; no rug in bedroom. House is cleaned sporadically by mother. Cat sleeps on bed. Dog comes in at times.
18. Sophomore in high school. All "A's"; on high school basketball team.
19. White, good family income, father a professional person; 4 other children, all well.
20. Smokes, uses makeup.
21. Go to page 53

START HERE !

Check the items you would like to inquire about, then refer to the corresponding code numbers in the left column for information.

___Seasonal variations....4

___Environmental variations............6

___Immunizations..........2

___Feeding (formula) problems as infant.....5

___Previous treatment.....7

___Emotional problems.....3

___Respiratory tract symptoms..............10

___Family history of skin trouble...........8

___Family history of respiratory allergy...12

___Any operations........15

___Previous illnesses....13

___Social conditions.....19

___School status.........18

___Drug sensitivity......14

___Environment...........17

___Present diet...........9

___Personal habits........1

___Questions about skin..................21

Check:

___Physical examination, Page 52
___Diagnostic studies, Page 54
___Diagnosis, Page 59

PHYSICAL EXAMINATION

Physical examination revealed a mature girl of 4' 11", weighing 110 pounds

TPR - BP-- not unusual

EENT-- slight scarring of tympanic membranes. Nose stopped up. Turbinates swollen, mucosa boggy. Throat not remarkable.

Neck-- unremarkable.

Skin-- As described initially.

Chest-- symmetrical. Lungs clear to P & A -- even on forced expiration. Fairly marked sinus arrhythmia.

Abdomen-- unremarkable.

Ext.-- unremarkable.

Neurological-- unremarkable.

Check your next step:

___Complete family and past history. Page 51

___Questions about skin. Page 53

___Diagnostic studies. Page 54

___Make your diagnosis. Page 59

QUESTIONS ABOUT SKIN CONDITION

Of the following items, only the ones which correspond to the code number on the right apply to this particular patient.

1. Yes. "It has come and gone for as long as I can remember."
2. "Heat, for one thing." "Any kind of real itchy material."
3. No.
4. "Off and on for the past two months."
5. "Perspiring a lot with strenuous exercise."
6. Yes. "A white cream in a tube given me by my doctor at home."
7. "In the past, when I was little, but not lately."
8. Yes. "Especially at night."
9. "If I eat a lot of fresh tomatoes, I usually break out worse the next day." "I dont't drink orange juice, but don't know if it would affect me."
10. "It depends--on the time of year, how long since I have had any skin cream."
11. Never.
12. Most of the time.

START HERE !

Check the items you would like to inquire about, then refer to the corresponding code number in the left column for information.

___How long has the present eruption been there?..........4

___Have you had it before?..............1

___What seems to make it appear?...........2

___What makes it worse?...............5

___How often does it recur?..............10

___Is it caused, do you think, by anything you eat?.............9

___Does it get worse when you are studying for exams?...........3

___Does anything help it?..................6

___Does the rash ever get runny or seem to have pus in it?.......7

Now what?

___Make your diagnosis? Page 59

___Obtain more past and family history? Page 51

___Do some diagnostic studies? Page 54

___General physical examination? Page 52

DIAGNOSTIC STUDIES

Please list the studies you would like to obtain.

____

____

____

____

____

Turn to page 55.

Diagnostic Studies:

Select the group which most closely approximates your own list.

____________Group A.	CBC Urinalysis Skin scrapings for fungi Look at skin under ultraviolet light	Page 56
____________Group B.	CBC, Urinalysis Allergy skin tests, Spirometry Chest x-ray Nasal smear for eosinophils	Page 58
____________Group C.	CBC, Skin culture Skin scrapings for fungi VDRL Urine porphyrins	Page 57

Group A. -- Diagnostic Studies

Hgb--13.5 gm%
Hct--40 %
WBC--6,400
Segs--38 %
Lymph--55 %
Monos--2 %
Eos--5 %

Urinalysis--neg.
Scrapings for fungi--none seen
Ultraviolet light--no difference

Check your next step:

___More diagnostic studies, Page 54

___Your diagnosis, Page 59

Group C.--Diagnostic Studies

Skin culture--Staph albus
Scrapings for fungi--none seen
VDRL--negative
Urine for porphyrins--negative

CBC:

Hgb--13.5 gm%
Hct--40 %
WBC--6,400
Segs--38 %
Lymph--55 %
Monos--2 %
Eos--5 %

Check your next step:

___More diagnostic studies, Page 54

___Your diagnosis, Page 59

Group B. -- Diagnostic Studies

Hgb--13.5 gm%
Hct--40 %
WBC--6,400
Segs--38 %
Lymph--55 %
Monos--2 %
Eos--5 %

Urinalysis--negative

Allergy Skin Tests:

Scratch--(No medication previous 24 hours)

House dust	3+	Mixed trees	1+
Kapok	1+	Elm	1+
Mix feathers	0	Oak	0
Mattress dust	2+	Walnut	1+
Cotton Linter	1+	Pecan	?
Tobacco smoke, ash	?	Mixed grasses	2+
Orris root	0	Mixed ragweed	?
Dog hair	?	Alternaria	?
Cat hair	?	Hormodendrum	?
Horse hair	?	Aspergillus	?
Animal glue	?	Penicillium	?
Wool	1+		
Pyrethrum	0		
Control	0		

Vital capacity--2860 cc
$FEF_{25-75\%}$ 1.8 L/sec
Chest X-ray--not unusual
Nasal smear (using Hansel's stain) showed numerous eosinophils.

Check your next step:

___More diagnostic studies, Page 54

___Your diagnosis, Page 59

Please write your diagnosis.

Turn to page 61.

Something other than listed:

Thank you for your response. It will help in revision of the text. Please make another choice.

DIAGNOSIS

In the following items, only the ones which correspond to the code numbers on the right apply to this particular patient.

1. Correct but incomplete. Make another choice.

2. Wrong. Make another choice.

3. In pediatric usage the term "neurodermatitis" refers to a skin eruption (usually isolated patches) produced by scratching which is primarily caused by emotional tensions. Chronic atopic eczema can certainly contribute to emotional problems or be aggravated by them, but they alone are not the basic etiologic factor. If eczema persists into adult life the lesions are likely to be dryer and more lichenified and the term "disseminated neurodermatitis" is used synonymously with "eczema." Make another choice.

4. Against this are the facts that the rash has been generalized, began in infancy, flared after ingestion of tomatoes, and is typical of atopic dermatitis in appearance and location with associated immediate type reactions and nasal symptoms. Patch tests, which involve delayed reactivity, are useful in determining etiology of contact dermatitis. Make another choice.

5. Secondary involvement rather than primary. Make another choice.

6. Go to page 62.

7. Unusual location and symptoms for cutaneous fungus infection. Make another choice.

8. Correct.

9. No. This began in early childhood--there are no circumscribed scaly patches. Lesions are typical.

10. No. Unusual in early childhood and no typical skin lesions. Make another choice.

11. Wrong. Make another choice.

12. Go to page 60.

⇩ START HERE !

Check the items below which you think are indicated as part or all of the diagnosis. Then refer to the corresponding code number in the column on the left for the information.

___Neurodermatitis........3

___Fungus infection, probably Monilia.......7

___Flexoral eczema (atopic)..............1

___Contact dermatitis.....4

___Lupus.................11

___Porphyria..............2

___Sweat gland disorder...5

___Allergic disposition manifested by eczema and allergic rhinitis..6

___Psoriasis............10

___Something other than the above............12

Final Diagnosis is:

Allergic disposition with symptoms of eczema (atopic dermatitis) and allergic rhinitis. No evidence of asthma to date.

This diagnosis is supported by the strong family history of allergy, the aggravation of skin symptoms by certain foods, the itching nose, throat, and ears, the slight increase in peripheral eosinophils, the presence of eosinophils in nasal secretions, the boggy swollen nasal mucosa, the immediate type of skin reactivity to inhalant antigens, and the typical appearance, location and history of the skin rash.

How will you manage the patient?

Write your answer.

____

____

____

____

____

____

____

Turn to page 63.

MANAGEMENT

Of the following items, only the ones which correspond to the code numbers on the right apply to this particular patient.

1. You are needlessly subjecting this girl to the effects of a dangerous drug.
2. Often give some degree of temporary improvement.
3. Contraindicated, since antihistamines are strong sensitizers when used topically. Plain calamine lotion may be effective for the itching.
4. Useful since acute weeping stage has passed. Tars are keratolytic, antipruritic. Disadvantages: They stain, are photosensitizing and may promote sterile furunculosis.
5. Rarely indicated because strong sensitizers when used topically.
6. Suggest trial period 10-12 days off wheat to determine if allergen since it is very difficult to avoid wheat. History indicates only tomatoes known to aggravate her eczema.
7. Unlikely the answer since she shows no evidence of severe emotional problem.
8. Good idea if parents can afford, as history indicates they can. Air conditioners filter some pollen and dust. Would diminish sweating which aggravates itching.
9. Nonsense.
10. Prove it is etiologically responsible, then recommend avoiding it. Remove for two weeks, then challenge.
11. Good! This alone may cause significant improvements in skin and nose.
12. Probably good.
13. Probably a good idea. These foods are relatively easy to avoid and are known potent sensitizers.
14. This may not be easy and may not result in immediate improvement due to danders left in rugs, bedding, etc., but they should at least be kept outside.
15. For seasonal allergic rhinitis, this may be only therapy indicated, if one can be selected with no side effects (often by trial and error). For year round allergic rhinitis and chronic recurrent skin allergy as exhibited by patient these have proved disappointing.
16. Go to page 64.
17. Go to page 65.
18. Go to page 66.
19. May give termporary relief but not recommended for continued regular use because of the rebound phenomenon and hypertrophy of mucosa which may result.

START HERE !

Check the items below which you think are appropriate. Then refer to the corresponding code number in the column on the left for information.

___Stop eating wheat in any form.......................6

___See a psychiatrist.........7

___Avoid chocolate, nuts and fish.................13

___Antihistamine p.o. PRN....15

___Talk with the mother......17

___Caladryl lotion (Benadryl plus calamine).............3

___Prednisone 40 mgm p.o. & taper off in 5 days........1

___Hyposensitization.........16

___Nasal spray or nose drops.19

___Coal tar ointment..........4

___Benzocaine (anesthetic) ointment..................5

___Get rid of cat and dog....14

___Get an air conditioner for bedroom................8

___Stop drinking milk........10

___Don't play basketball or other strenuous exercise...9

___Pay more attention to cleaning bedroom and move any expendable furniture to other rooms............11

___Sudafed (pseudoephedrine) p.o. PRN for nasal stuffiness.....................12

___Discourage smoking cigarettes................18

___Topical steroid............2

Directory:
After completing your Management, go to page 67 for Summary of Case.

HYPOSENSITIZATION

This is a rather troublesome and time consuming procedure which involves visits to the physician at least weekly for many months and there is always a slight danger of a reaction. Therefore, the morbidity or "nuisance value" must be fairly great to warrant this kind of therapy.

If this girl's skin and nasal problems become resistant to therapy or even more troublesome than at the present, hyposensitization may become indicated in the future.

Please return to page 63 and continue
with your management.

TALK WITH MOTHER

Good idea, if handled discreetly. Teen-agers will seldom want mother involved, but mother is supposedly the housekeeper and needs instruction regarding dust control, etc.

Also--teen-ager will frequently understate the problem--and/or not be aware of allergic mannerisms apparent to other family members, such as sniffing, snorting, scratching, or coughing in sleep, etc.

Please return to page 63 and continue with your management.

DISCOURAGE SMOKING

The possibility of the later development of some degree of bronchospastic disease (asthma) is real in individuals with the longstanding personal and family history of allergy that this young lady has, so the irritant effects of cigarette smoke should certainly not be added. Smoking would probably aggravate her rhinitis, also. These facts should be discussed with the patient.

Members of family should also be discouraged from smoking in the home.

Please return to page 63 and continue
with your management.

SUMMARY OF CASE

This teen-age girl with long-standing but fairly mild atopic eczema and allergic rhinitis improved in both areas after she was given a topical steroid cream and her bedroom was stripped and cleaned thoroughly and regularly. The cat remained outside the bedroom (but still in the house). She avoids chocolate, nuts and eggs most of the time and vows she will never smoke. She avoids wool clothing and blankets.

She is typical of many patients with allergic problems which are more of a nuisance than life-threatening. However, appropriate allergic managment helps to make thier lives more enjoyable and may prevent development of more severe allergic problems later.

Go on to the NEXT CASE.

VII. PROBLEM 10

A woman of 65 is referred to you by a friend because of vaginal bleeding of 4 months' duration. The patient states that the bleeding has consisted of intermittent spotting with occasional gushes. This is the first bleeding she has noted since her menopause 20 years previously. On the following pages you can obtain further information about her history and physical findings and the results of various diagnostic studies and procedures. When you have obtained as much information as you think you need, turn to PAGE 151a to diagnose and manage the problem.

DIRECTORY

More history. PAGE 148a
Physical examination. PAGE 149a
Diagnostic studies and procedures. PAGE 150a
Diagnosis and management. PAGE 151a

ANSWERS

1. No complaints (R)
2. Has trouble with gas (R)
3. Died in accident (R)
4. None for 10 years (R)
5. Widowed 20 years ago (R)
6. Drinks a quart of whiskey a week (R)
7. Menarche at 14, menopause at 42, no complaints till PI (I)
8. Uses sleeping pills occasionally (R)
9. Ten lb. weight loss in last 6 months (R)
10. Fell and broke hip 3 years ago (R)
11. Occasional urgency and frequency, no burning (R)
12. Tenth grade (R)
13. Shares house with elder sister (R)
14. Has had trouble with hip since accident (R)
15. None (R)
16. None (R)
17. Doesn't know (S)
18. One sister 72, A&W (R)
19. Dead (R)
20. Occasional headaches (R)
21. Gets short of breath when she is nervous (R)
22. None (R)
23. No report (S)
24. No information (S)
25. Absent (S)
26. No complaints (S)
27. No information (R)
28. Not reported (S)
29. Died of (?) cause (S)
30. Hip nailed 3 years ago. (R)

CODE

I = Indicated, required by presenting problem.
R = Routine, for screening or completeness of evaluation.
U = Probably useless, but harmless in this case.
C = Contraindicated, not in patient's interest.
S = Spurious, bogus answer.

MORE HISTORY

You may assume that the chief complaint and present illness as given are complete and correct. For additional information, please check the items below which interest you, then find the answers with the corresponding code numbers in the column on the left.

Past medical history

Illnesses	22( )
Injuries	10( )
Operations	30( )
Pregnancies	15( )

Family history

Father	3( )
Mother	19( )
Siblings	18( )
Others	27( )

Social history

Schooling	12( )
Occupation	16( )
Home environment	13( )
Marital situation	5( )
Sex life	4( )
Habits	6( )
Drugs and medicines	8( )

System review

General (wgt., fever, weakness, etc.)	9( )
HEENT	20( )
CVR	21( )
GI	2( )
GU	11( )
GYN	7( )
NP	1( )
Musculoskeletal	14( )

DIRECTORY (your next step)

Physical examination. PAGE 149a
Diagnostic studies and procedures. PAGE 150a
Diagnosis and Management. PAGE 151a

FINDINGS

1.	Confirms pelvic	(R)
2.	Stenotic atrophic, well supported	(R)
3.	37°, 75, 20, 140/75	(R)
4.	Flat	(R)
5.	Midline	(R)
6.	Not present	(I)
7.	Twice normal size, anterior	(I)
8.	Same findings under anesthesia	(I)
9.	None palpable	(I)
10.	White	(R)
11.	Unremarkable	(R)
12.	Normal size, no murmurs	(R)
13.	Wears dentures	(R)
14.	Intact	(R)
15.	Unobstructed	(R)
16.	Clear to P&A	(R)
17.	Atrophic	(R)
18.	Thin frail elderly WF	(R)
19.	Not palpable	(I)
20.	Not palpable	(I)
21.	Not enlarged	(R)
22.	Unremarkable	(R)
23.	Well formed	(R)
24.	Not enlarged	(R)
25.	Within normal limits	(R)
26.	None palpable	(I)
27.	Not enlarged	(R)
28.	Atrophic and stenotic	(I)
29.	5'2", 105 lbs.	(R)
30.	Unremarkable	(R)
31.	Dry	(R)
32.	Flat, no scars	(R)
33.	Symmetrical	(R)
34.	Normal for elderly adult	(R)
35.	Present and equal	(R)
36.	Atrophic, no masses	(R)
37.	Atrophic, flush with vault	(I)
38.	Physiologic	(R)
39.	Arcus senilis, no abnormalities, fundi normal	(R)
40.	Supple	(R)

CODE

I = Indicated, required by presenting problem.
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U = Probably useless, but harmless in this case.
C = Contraindicated, not in patient's interest.
S = Spurious, bogus answer.

GENERAL PHYSICAL EXAMINATION

Please check the items below which you would like to examine, then look up the findings with the corresponding code numbers in the column on the left.

TPR, BP	3( )
Hgt., wgt.	29( )
General description	18( )
Skin	31( )
Lymphatics	27( )
Head and face	22( )
Hair	10( )
Eyes	39( )
Ears	30( )
Nose	15( )
Mouth, teeth, throat	13( )
Neck	40( )
Trachea	5( )
Thyroid	24( )
Vessels	4( )
Chest	33( )
Breasts and axillae	36( )
Heart	12( )
Lungs	16( )
Abdomen	32( )
LSK	20( )
Masses	9( )
Tenderness	6( )
Pelvic examination	8( )
Hair distribution	34( )
Ext. genitalia	17( )
SUB glands	21( )
Introitus and perineum	2( )
Vagina	28( )
Cervix	37( )
Uterus	7( )
Adnexa	19( )
Rectal	1( )
Sphincter	14( )
Masses	26( )
Back	11( )
Extremities	23( )
Pulses	35( )
DTRS	38( )
Neurological	25( )

DIRECTORY (your next step)

History. PAGE 148a
Tests and Procedures. PAGE 150a
Diagnosis and Management. PAGE 151a

RESULTS

1. Within normal limits (R)
2. Cervicitis (I)
3. 140, 4.3, 98 (U)
4. Normal film (I)
5. Normal film (U)
6. Normal film (I)
7. Endocervical tissue; adenomatous hyperplasia of the endometrium (S)
8. Not reported (I)
9. Normal function, bilaterally (I)
10. O, positive (R)
11. Endocervical scrapings: endocervical tissue; endometrial scrapings; adenoacanthoma of the endometrium (I)
12. Not available (U)
13. Sp. G. 1.018, pH 6, alb. sugar microscopic, negative (R)
14. Uterus twice normal size; parametria and adnexa no masses felt (U)
15. 110 mgm% (R)
16. Within normal limits (R)
17. Not done (U)
18. Negative (R)
19. Not done (U)
20. Negative film, except for intramedullary nail in neck of left femur and severe osteoarthritic changes in joint (I)
21. Not done (C)
22. Non-reactive (R)
23. Within normal limits (I)
24. Negative film (I)
25. Not done (C)
26. No abnormal findings (I)
27. Class II, (negative), castrate smear (I)
28. Not done (C)
29. 12 mgm% (R)
30. No report (U)

CODE

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R = Routine, for screening or completeness of evaluation.
U = Probably useless, but harmless in this case.
C = Contraindicated, not in patient's interest.
S = Spurious, bogus answer.

DIAGNOSTIC STUDIES

Please check the items below about which you would like information, then look up the results with the corresponding code numbers in the column at the left.

Chemistries (blood, serum)	
Bilirubin, direct, total	30( )
Glucose, 2 hr. postprandial	15( )
Electrolytes, Na, K, Cl	3( )
Urea nitrogen (BUN)	29( )
Clinical and cytopathology	
Stool for blood, OCP	18( )
Vaginal Pap smear	27( )
Serology	
VDRL	22( )
Hematology	
Blood group, Rh	10( )
CBC	16( )
Urine tests	
Urinalysis, complete	13( )
X-rays	
Abdomen, upper	5( )
Barium enema	24( )
Chest	4( )
Cholecystogram	12( )
GI series	17( )
Pelvis, AP, lateral	20( )
Pyelogram (IVP)	9( )
Skull	6( )
Spine, thoracic, lumbar	8( )
Procedures and surg. pathology	
Biopsy bladder	21( )
Biopsy cervix	2( )
Biopsy rectum	28( )
Biopsy vagina, vulva	25( )
Cystoscopy	23( )
D&C (fractional)	11( )
Electrocardiogram	1( )
Glucose tolerance test	19( )
Examination under anesthesia	14( )
Proctosigmoidoscopy	26( )

DIRECTORY (your next step)

History. PAGE 148a
Physical examination. PAGE 149a
Diagnosis and management. PAGE 151a

YOUR DIAGNOSIS AND MANAGEMENT

Please write down your diagnoses (primary and secondary).

With the above as your diagnoses, what would your next step in management be?

Write your answer, then turn to PAGE 152a.

(Your Diagnosis)

(Your Management)

From the list below select the management which corresponds most closely with your own then turn to the PAGE indicated.

- ☐ Observe for further bleeding. PAGE 153a
- ☐ Biopsy the endometrium with a suction curet. PAGE 157a
- ☐ Perform a fractional D&C. PAGE 158a
- ☐ Perform a total hysterectomy. PAGE 159a
- ☐ Perform a total hysterectomy and bilateral salpingo-oophorectomy. PAGE 161a
- ☐ Start treatment with intracavitary radium. PAGE 162a

OBSERVE FOR FURTHER BLEEDING

Result: Patient bleeds further. Please review

FRAMES 466-476 in Essentials of Gynecologic Oncology.

then return to PAGE 147a of this problem and rework the problem.

BIOPSY THE ENDOMETRIUM WITH A SUCTION CURET

Pathologic Diagnosis: Endometrial hyperplasia

Please review

FRAMES 466-476 in Essentials of Gynecologic Oncology.

Then return to PAGE 152a and choose another response.

PERFORM A FRACTIONAL D&C

This is an appropriate choice if you omitted it from the diagnostic studies and procedures listed on PAGE 150a. Please turn to PAGE 150a to obtain your results. After you have done so, return to PAGE 152a and select an additional approach to management.

TOTAL HYSTERECTOMY

This is an inappropriate operation considering this patient's pathologic diagnosis. The therapy of this lesion is considered in

FRAMES 477-516 of Essentials of Gynecologic Oncology.

Please review this section then return to PAGE 152a and choose a more appropriate approach to management.

TOTAL HYSTERECTOMY AND BILATERAL SALPINGO-OOPHORECTOMY

This is an appropriate operation considering the patient's pathologic diagnosis. Only a minority of clinicians, however, recommend it as the first step in treatment. The therapy of this lesion is considered in

FRAMES 477-516 of Essentials of Gynecologic Oncology.

Please review this section then return to PAGE 152 and choose a more widely accepted approach to the management of this problem.

START TREATMENT WITH INTRA-CAVITARY RADIUM THERAPY

This is appropriate therapy. The treatment of endometrial carcinoma is covered briefly in

FRAMES 477-516 of Essentials of Gynecologic Oncology.

Please review these frames if you wish to do so; otherwise, proceed directly to Problem 11, PAGE 163a.

VIII. SUMMARY OF THREE-DIMENSIONAL, LEARNING-TEACHING PROBLEM

Problem: To teach your colleague to put the correct dots on a die in one minute.

Two-minute Trial: Non-programmed approach using die and sugar cubes.

Repeat two-minute Trial--with participants changing jobs.

Analysis of Problem:

(a) What dot arrangements are symmetrical from any angle?

(b) What is opposite each of these sides?

(c) What do these opposite-side combinations all have in common?

(d) What dot arrangements are asymmetrical and present a problem in placement?

(e) Can the die be positioned so that all asymmetrical sides are visible at once?

(f) Visual mnemonic:

6 up

2 2's

2 3's

(g) Verbal mnemonic:

"2 on right"

IX. THE STEPS IN PROGRAMMING

1. Identify objectives behaviorally, and if possible, quantitatively.

2. Analyze problem for what must be learned.

3. Create the learning materials (teach).

4. Try draft on learners.

5. Evaluate learners' performances.

6. Revise draft and/or objectives.

7. Repeat steps 4, 5, and 6 to fill the requirements of programmers, learners and course objectives until all are satisfied.

X. READING ASSIGNMENTS

A. METHODS OF CONCEPTION CONTROL

1. For what population is this material appropriate?

    ____

2. What are other possible applications of this method or technique for other materials? _________________________

3. How could you tell if this material has been learned?

    ____

B. AN INTRODUCTION TO STEROID BIOCHEMISTRY AND ITS CLINICAL APPLICATION

1. For what population is this material appropriate?

    ____

2. What are other possible applications of this method or technique for other materials? _________________________

3. How could you tell if this material has been learned?

    ____

C. NEOPLASMS OF THE UTERINE CERVIX

1. For what population is this material appropriate?

    ____

2. What are other possible applications of this method or technique for other materials? _________________________

3. How could you tell if this material has been learned?

    ____

D. "PROGRAMMED INSTRUCTION IN GYNECOLOGIC CANCER AT THE MEDICAL STUDENT LEVEL:" American Journal of Obstetrics and Gynecology.

XII. TEACHING CONTROVERSIAL MATERIALS BY MEANS OF PROGRAMMED INSTRUCTION

In preparing programmed materials, how should one handle controversial material? The beginning program writer is often led astray by a commonly held misconception that linear programming styles, which usually limit themselves to teaching the "right" answers, are best suited for the handling of non-controversial subjects, and that branching formats are needed to handle controversy.

Actually, the use of programmed instruction to teach subjects involving controversy or debate follows the same principles as the use of programmed instruction to teach non-controversial subjects, and has little to do with distinctions between linear and branching programming formats. The programmer must decide first of all on his objectives. He must decide what outcome he desires in terms of student behavior. Once he has made this decision, the appropriate programming strategy is usually readily available.

ATTITUDES IN LEARNING CONTROVERSIAL MATERIAL

I. Student Non-involvement

The student learns that the issue is controversial and can be safely ignored until others resolve it by further study or research. He feels no personal responsibility for further learning in this area so long as the issue remains controversial.

II. Student Unilateral Involvement

A. The Teacher's Viewpoint

1. The student learns only the teacher's viewpoint in the controversy but learns it with enough emotional learning involvement to defend it vigorously.

2. The student learns the teacher's viewpoint in the controversy with enough emotional involvement to defend it vigorously and, in addition, learns enough of the opposing viewpoints to be able to attack them effectively.

B. The Learner's Viewpoint

The student selects his own viewpoint in the controversy and learns enough to defend it vigorously, ignoring the opposing views.

III. Student Multilateral Involvement

The student learns the different sides of the controversy with so much involvement that he seeks to resolve the controversy on his own initiative through further study, inquiry, or research.

Of the attitudes described above, each is appropriate in its place. Each can be achieved through the use of appropriate strategies. Many teachers, however, have difficulty achieving compatibility between their objectives and their teaching methods.

STRATEGIES FOR TEACHING CONTROVERSIAL MATERIALS

I. To Obtain Student's Non-involvement

The lecturer apologizes in advance. He informs the student that the issue is controversial, unsettled and must await the result of further research. When this is tried in a lecture, the students lay down their pencils till the lecturer gets back on solid ground.

II. To Obtain Student's Unilateral Involvement

A. The Teacher's Viewpoint:

He makes an appropriate sales pitch, using the soft sell as necessary. If he thinks that opposing viewpoints may carry some weight, he is sure to acknowledge them, as he amplifies their deficiencies.

B. The Learner's Viewpoint:

In conventional teaching situations, the student who masters this approach is simply following the example of his teacher and beating him at his own game with an opposing view. A one-sided programmed text can have the same effect as a one-sided teacher. They both tend to elicit strong opinions from some students, with a minimum enlightenment.

III. To Obtain Student's Multilateral Involvement

A. The Teacher's Sequence:

The teacher can present, in any sequence he chooses, each viewpoint of the controversy in an impartial manner, giving each viewpoint his most persuasive sales pitch possible. Neither before nor afterwards does he intimate that the issue is controversial. He simply presents all sides of the controversy as persuasively as possible and then moves on to the next topic. Depending on how well he has held his students' attention, the group will range from non-involvement through several different varieties of unilateral involvement to a few who, having paid careful attention to his entire presentation, are now multilaterally involved.

B. The Learner's Sequence:

The student works through and learns all aspects of the controversy in a sequence he chooses for himself. For the autonomous learner this is undoubtedly the best and most efficient way. Superior students have always learned by this method, in spite of the best efforts of teachers and programmers, and doubtless will continue to do so. Programmed materials, properly used, should enhance rather than limit the freedom of students to learn best in their own way.

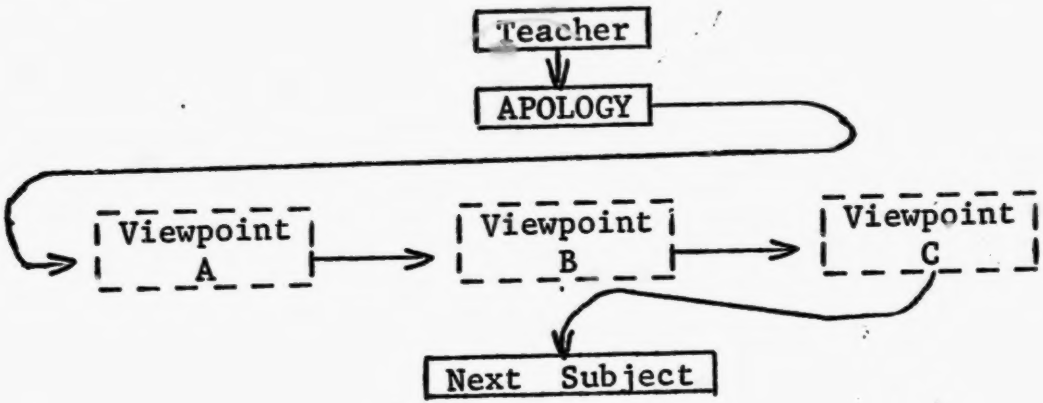

Teacher
APOLOGY
Viewpoint A
Viewpoint B
Viewpoint C
Next Subject

FIGURE 1. TEACHING NON-INVOLVEMENT (LINEAR)

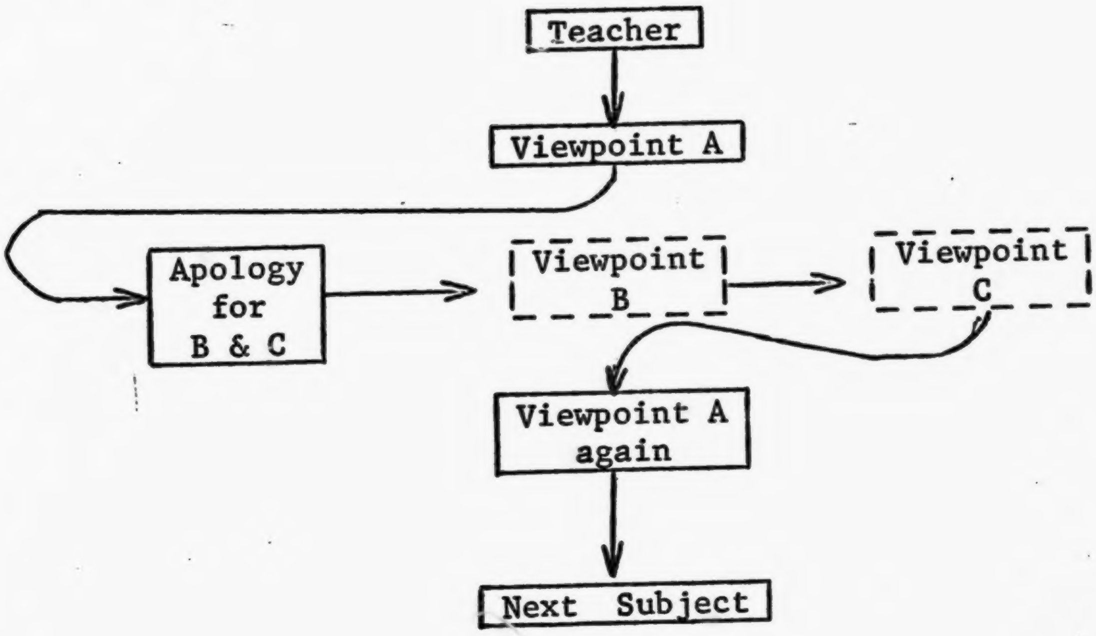

Teacher
Viewpoint A
Apology for B & C
Viewpoint B
Viewpoint C
Viewpoint A again
Next Subject

FIGURE 2. TEACHING UNILATERAL INVOLVEMENT (LINEAR)

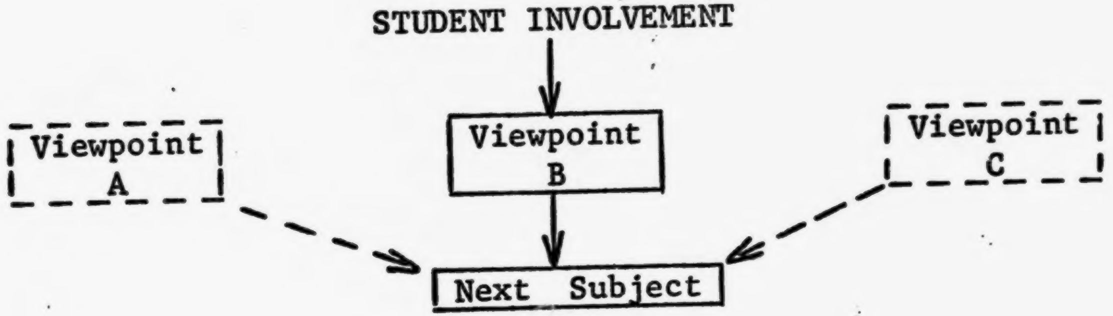

STUDENT INVOLVEMENT
Viewpoint A
Viewpoint B
Viewpoint C
Next Subject

FIGURE 3. STUDENT'S UNILATERAL INVOLVEMENT (LINEAR)

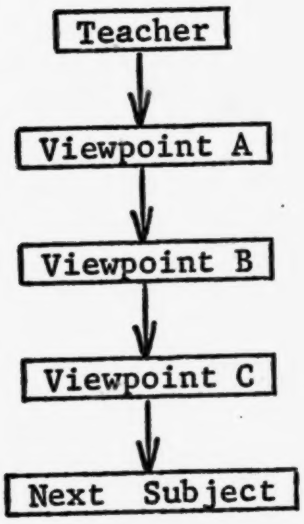

Teacher
Viewpoint A
Viewpoint B
Viewpoint C
Next Subject

FIGURE 4. MULTILATERAL INVOLVEMENT

TEACHER'S SEQUENCE (LINEAR)

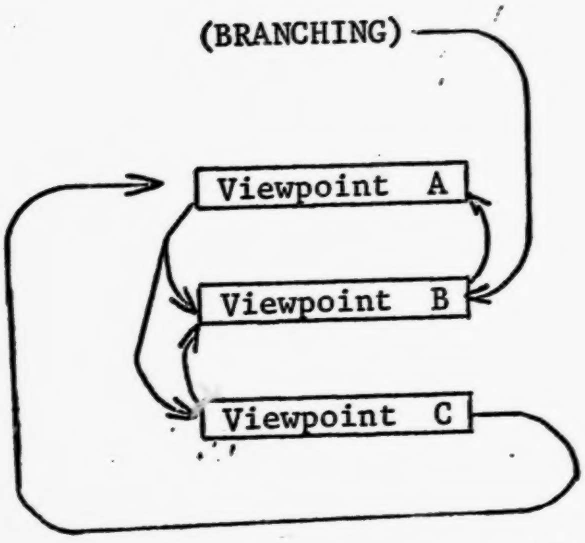

(BRANCHING)
Viewpoint A
Viewpoint B
Viewpoint C

FIGURE 5. MULTILATERAL INVOLVEMENT

STUDENT'S SEQUENCE (BRANCHING)

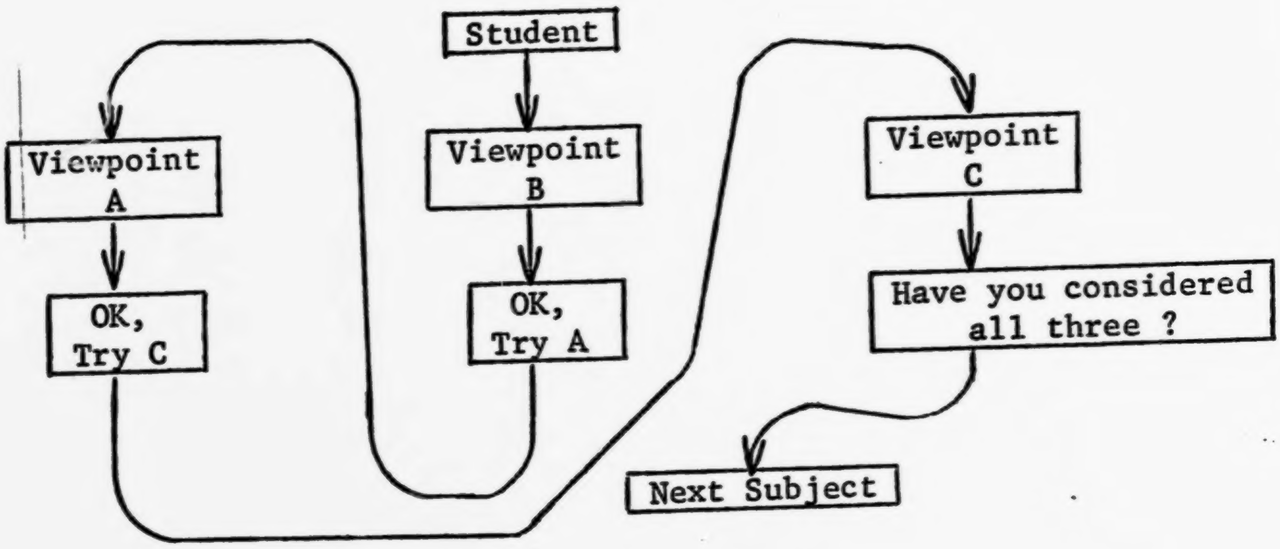

Student
Viewpoint A
Viewpoint B
Viewpoint C
OK, Try C
OK, Try A
Have you considered all three ?
Next Subject

FIGURE 6. TEACHING MULTILATERAL INVOLVEMENT

TO STUDENT WITH UNILATERAL BIAS (BRANCHING ⟶ LINEAR)

SUMMARY

Appropriate handling of controversial material in programmed instruction formats, as well as in other types of teaching, requires that the programmer decide in advance what outcome he desires in terms of student behavior. The desired degree of student involvement can be classified as follows:

1. Student non-involvement
2. Student unilateral involvement
3. Student multilateral involvement

Once the desired outcome has been determined, the controversial material should be developed to meet the behavioral objectives determined by the programmer.

XII. GOOD PROGRAMS THAT DO NOT TEACH

The use of programmed texts of proven effectiveness, efficiency, and acceptability poses special problems in educational settings in which the use or non-use of all texts is a voluntary matter left to the discretion of the individual learner. Of more than 30 programmed texts of proven quality, formerly in use at this institution, more than half are presently failing to serve any teaching function because they are no longer used. A review of the use and non-use of each of these texts had led to these conclusions:

1. The most important factor influencing the teaching effectiveness of a programmed text is whether it meets the learner's perception of his "need to know."
2. The learner's perception of his "need to know" seems to be determined by several factors including:
   a. The learner's perception of demands on the part of peer groups (students, residents, etc.) and the public (patients) for competence in this subject matter.
   b. The learner's perception that the text meets a personal need.
3. Another factor is continued faculty support for and interest in the subject matter of the text.
4. Still another factor is demands of the examination system for competence in the subject matter.

"Good" programmed texts can be shelved by:

1. A change in faculty personnel.
2. A change in faculty interest.
3. Either a decreased or greatly increased emphasis in the subject matter.
4. A change in examination procedures effecting the emphasis on the subject matter.

SUMMARY: In the preparation and implementation of programmed materials, it is important that the effectiveness, efficiency, and acceptability of the materials be assured. But it is more important that the setting in which the programmed materials are to be used be structured so that continued use of these materials will be assured.

-APPENDICES-

A. DIAGRAMMING A PROGRAMMED CASE

Programmed instruction has certain characteristics which distinguish it from other methods of teaching. First, it has the great advantage over other educational media in that it can offer guaranteed learning; the person who completes a properly constructed programmed text can demonstrate that he had learned whatever it was that the text was supposed to teach him. Second, programmed instruction, regardless of the format, is based upon learning principles which sound like common sense.

First, the course content is defined behaviorally in terms of what the student should demonstrate he has learned rather than what the teacher intends to present.

Second, the material of the course is divided into units which require a triple exchange of information:

(1) a stimulus in which the program gives information to the student in a form which requires his active participation,

(2) a response in which the student reveals to the program what he has learned,

(3) a feedback in which the program tells the student how he is doing and often provides a new stimulus for his next step.

Finally, the entire sequence package must be pretested using representative samples of students and continually revised until the teacher and the student are satisfied that it accomplishes its objectives successfully.

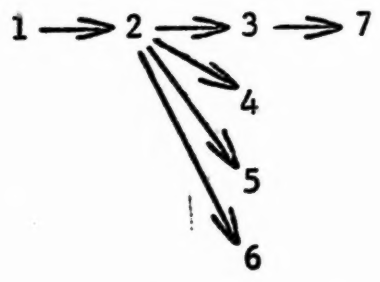
The instructional unit in most programmed texts is called the frame. This term is a carry-over from the earliest days of teaching machines, when the word frame was used to describe what appeared in a little transparent window on the machine.

In case presentation programming, the instructional unit is much larger and more complicated. The unit is the case or problem, not the frame or the page.

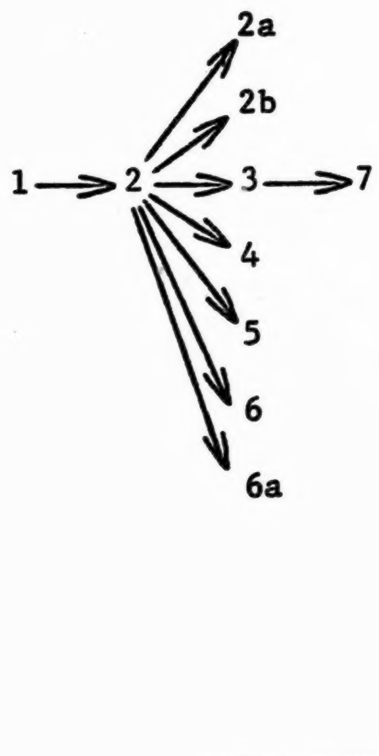
The construction of such a unit requires that we have a way of keeping track of the frames or pages. In the actual writing of the case, this is done in a simple make-shift fashion by marking down numbers to represent the pages and using arrows to show how to get from one page to the next. For example, the start of a problem might be diagrammed like this:

1 → 2

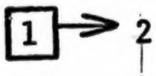
The page numbers do not need to be consecutive or set down in any logical order.



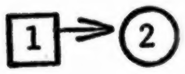
Afterthoughts can be added as necessary:



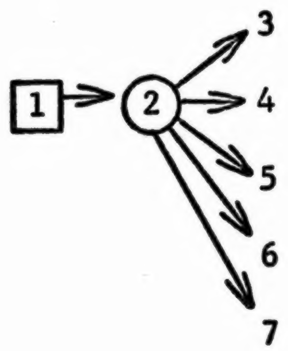
Diagrams such as this are all that you need in the actual writing in the first draft of a case. Later on, you may wish to represent on paper the interrelationships of the different pages in a less make-shift fashion. We may begin by developing a diagram for Problem 1. This first case, on the first page, presents the necessary information required to solve the problem. The page calls for a written response and then sends the learner to page 2. We use the convention of a square to indicate a page requiring a written response. The first page of the program can be indicated by writing down the page number, putting a square around it, and showing an arrow leading to page 2.



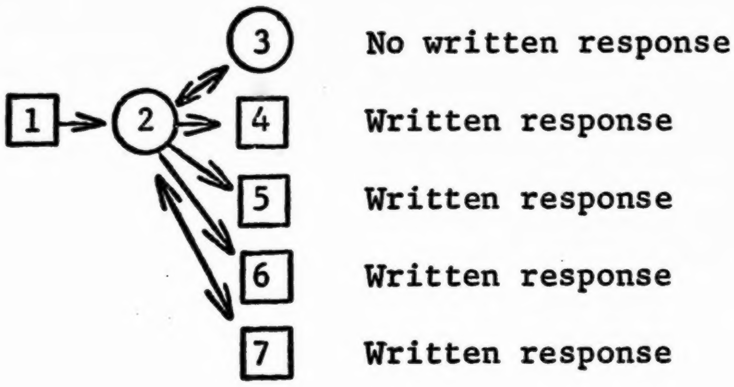
The second page calls for no written response. Its page number should be circled.



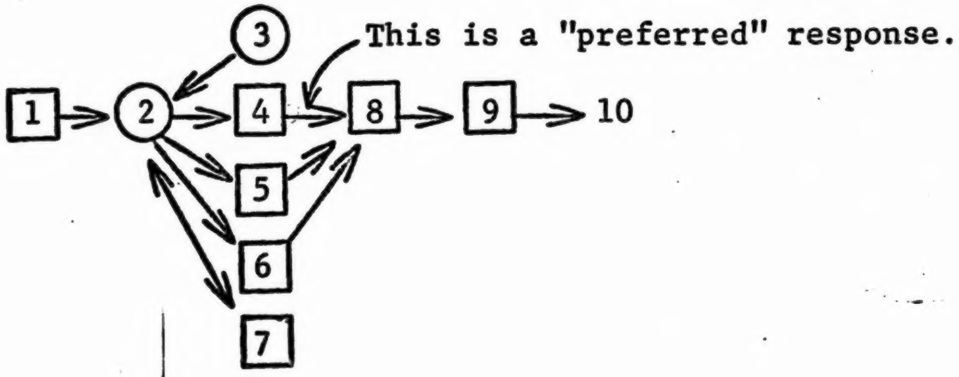
Page 2 is a multiple-choice question leading to five different pages. These may be indicated by numbers and arrows.



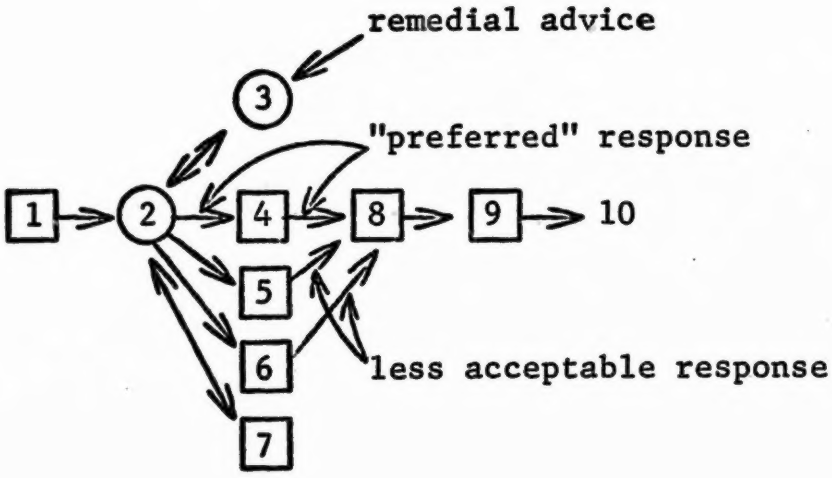
One can indicate by squares and circles which frames require written response and which ones don't, and by arrows how the frames are inter-connected.


1
2
3
No written response
4
Written response
5
Written response
6
Written response
7
Written response

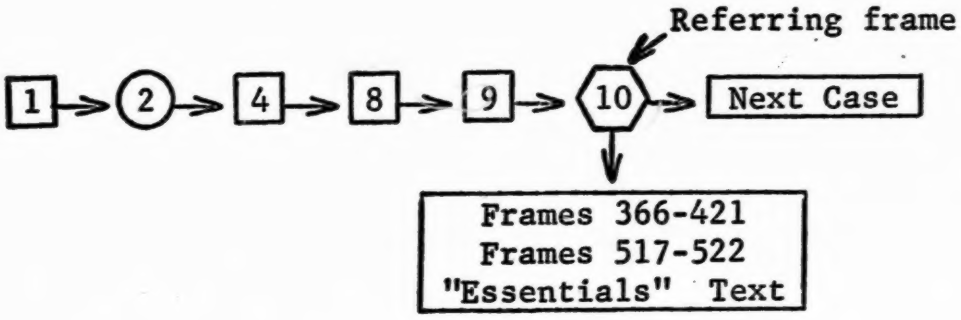
As branches occur, the "preferred" response may be indicated by keeping them on a horizontal line with progress from left to right.


This is a "preferred" response.
1
2
3
4
8
9
10
5
6
7

Directions of arrows other than horizontal, left to right, can be used to indicate erroneous responses, remedial advice, etc.


remedial advice
3
"preferred" response
1
2
4
8
9
10
5
6
7
less acceptable response

A hexagon ⬡ is used to indicate advice to the student to seek help elsewhere.


Referring frame
1
2
4
8
9
10
Next Case
Frames 366-421
Frames 517-522
"Essentials" Text

Problem 1, diagrammed completely, uses the following symbols:

LEGEND

○ = No written response

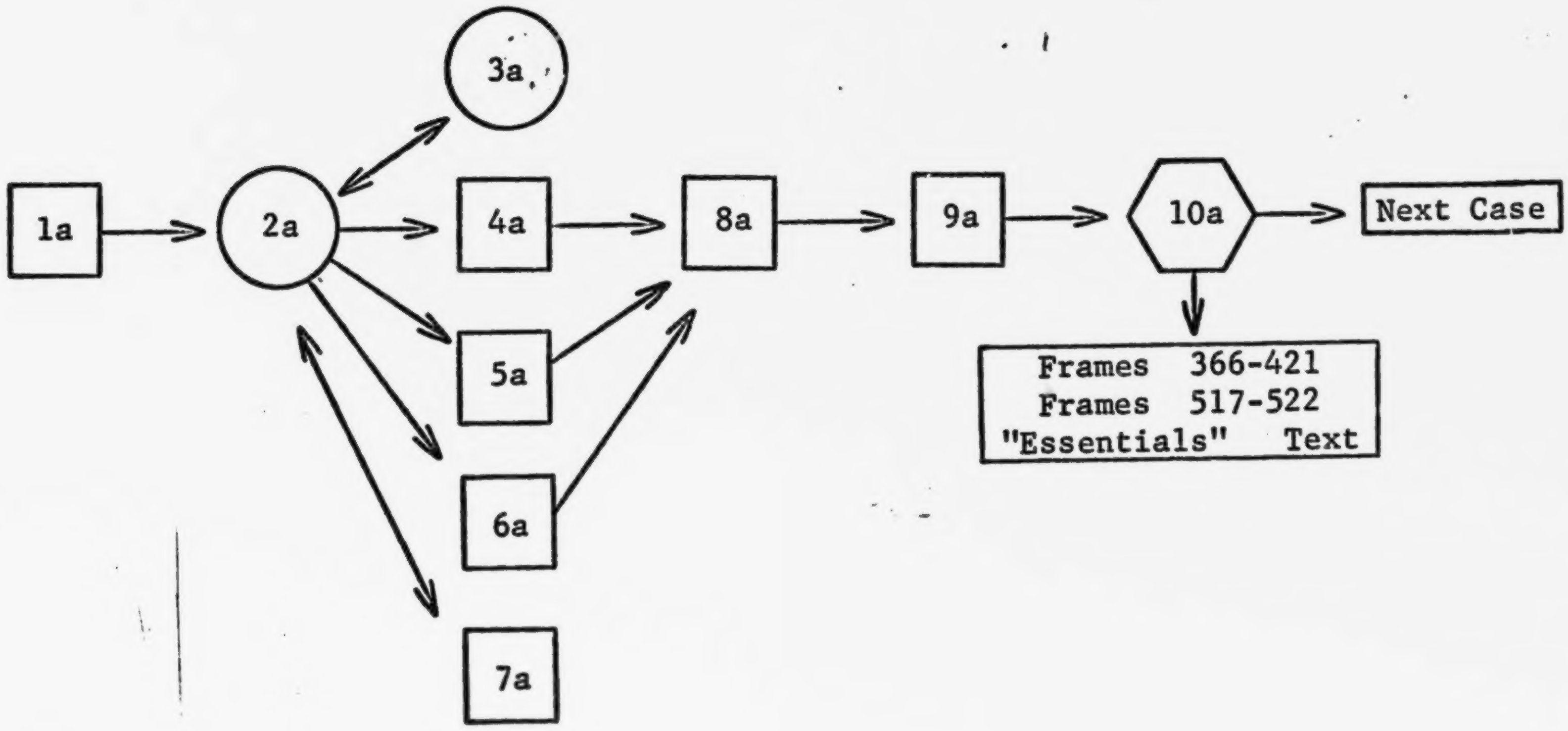
□ = Written response

⬡ = Referring frame

[366-421] = Frames in other text

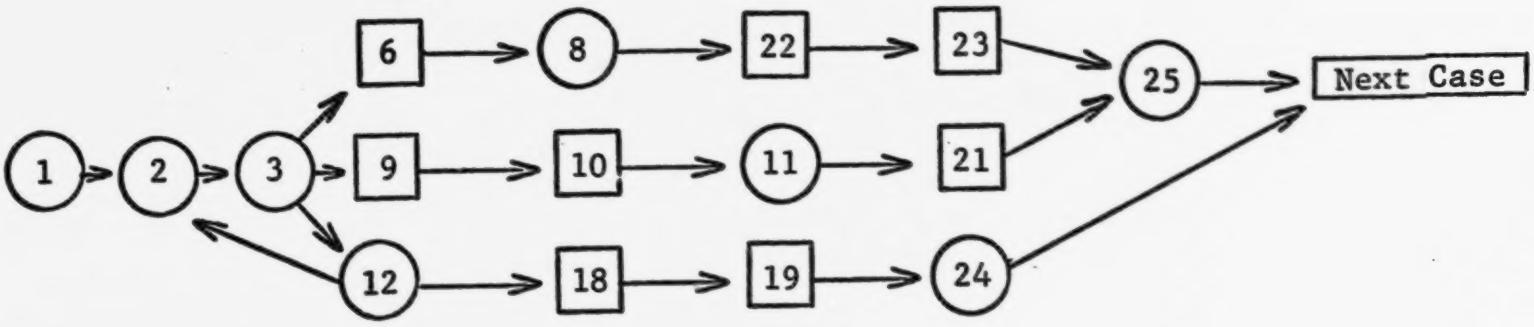
Please prepare your own diagram of Problem 1.

When you have completed your diagram, you will find ours on the next page.


1a
2a
3a
4a
5a
6a
7a
8a
9a
10a
Next Case
Frames 366-421
Frames 517-522
"Essentials" Text

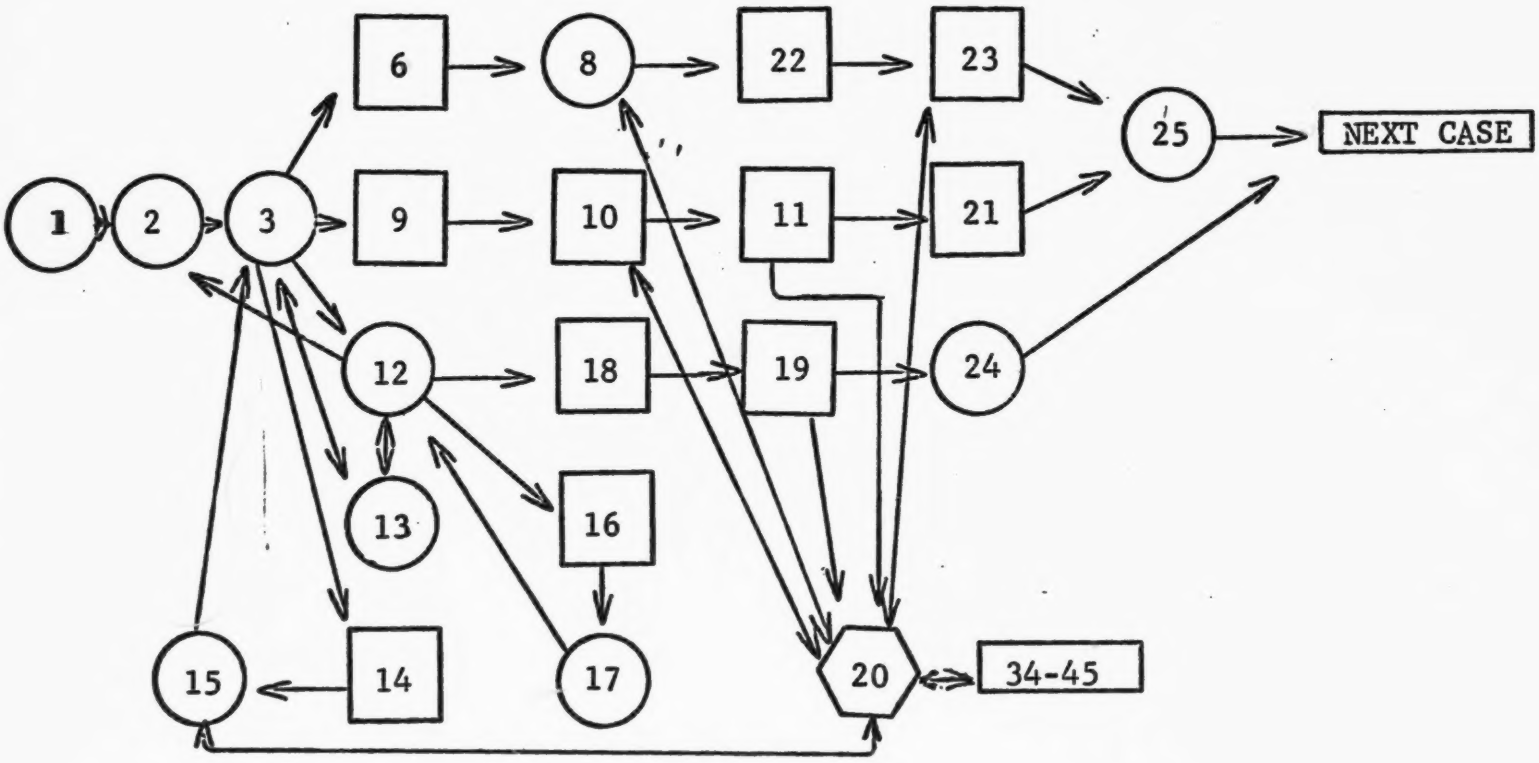
PROBLEM 1

In some problems there may be several parallel tracks leading to an appropriate solution to the problem, each with its advantages and disadvantages. The diagram of Problem 5, from the gynecologic oncology series, shows a case dealing with an ulcerated epithelial lesion, in which there are three parallel tracks leading to the solution of the problem as well as other branches which lead to remedial instruction. Here are the three tracks:



On the next page is a diagram of the complete case, with additional wrong-answer branches and directions for remedial instruction.

DIAGRAM OF CASE


1
2
3
6
8
22
23
25
NEXT CASE
9
10
11
21
12
18
19
24
13
16
15
14
17
20
34-45

LEGEND

○ = No written response

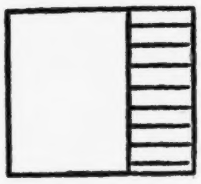
□ = Written response

▥ = Data-gathering frame

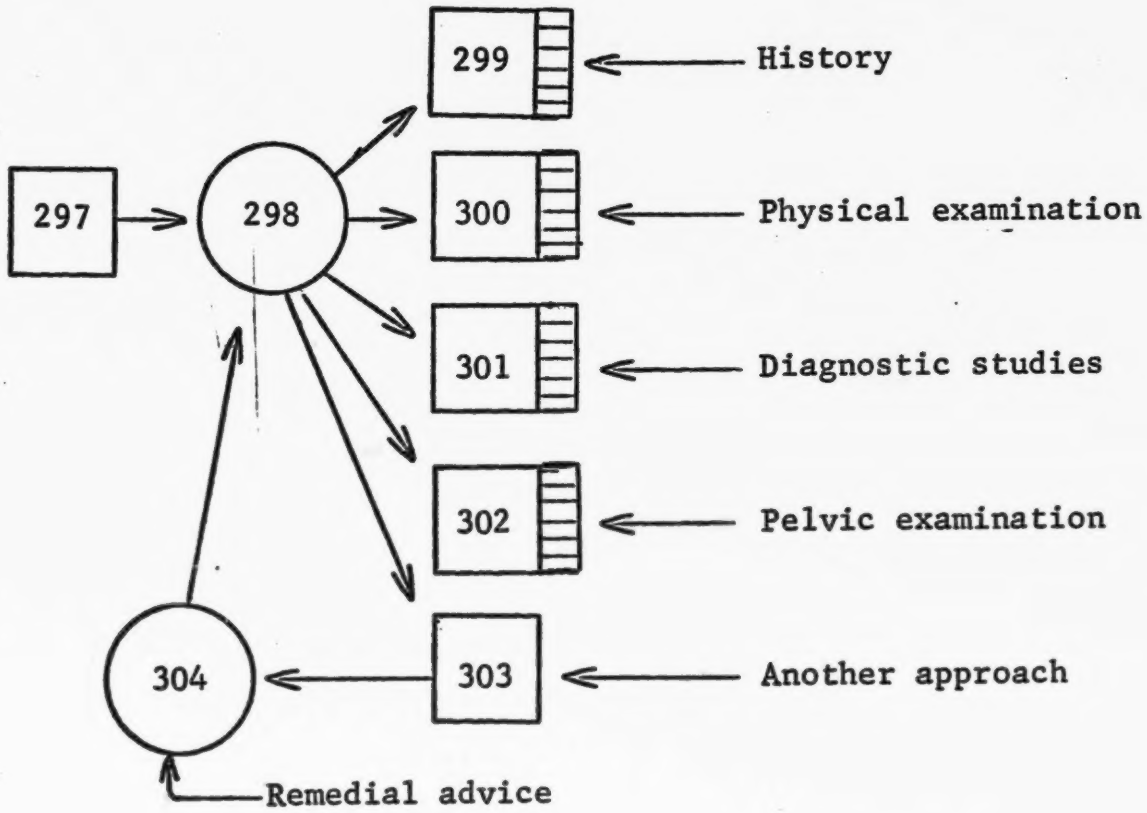
⬡ = Referring frame

321-361 = Frames in other text

In cases where there are data-gathering pages such as history, physical examination, etc., an additional symbol may be used.



Problem 33 from the gynecology course contains four such pages.


299
History
297
298
300
Physical examination
301
Diagnostic studies
302
Pelvic examination
304
303
Another approach
Remedial advice

Here is a review of the symbols used to diagram a programmed case.

Fill in the labels then turn the page.

LEGEND

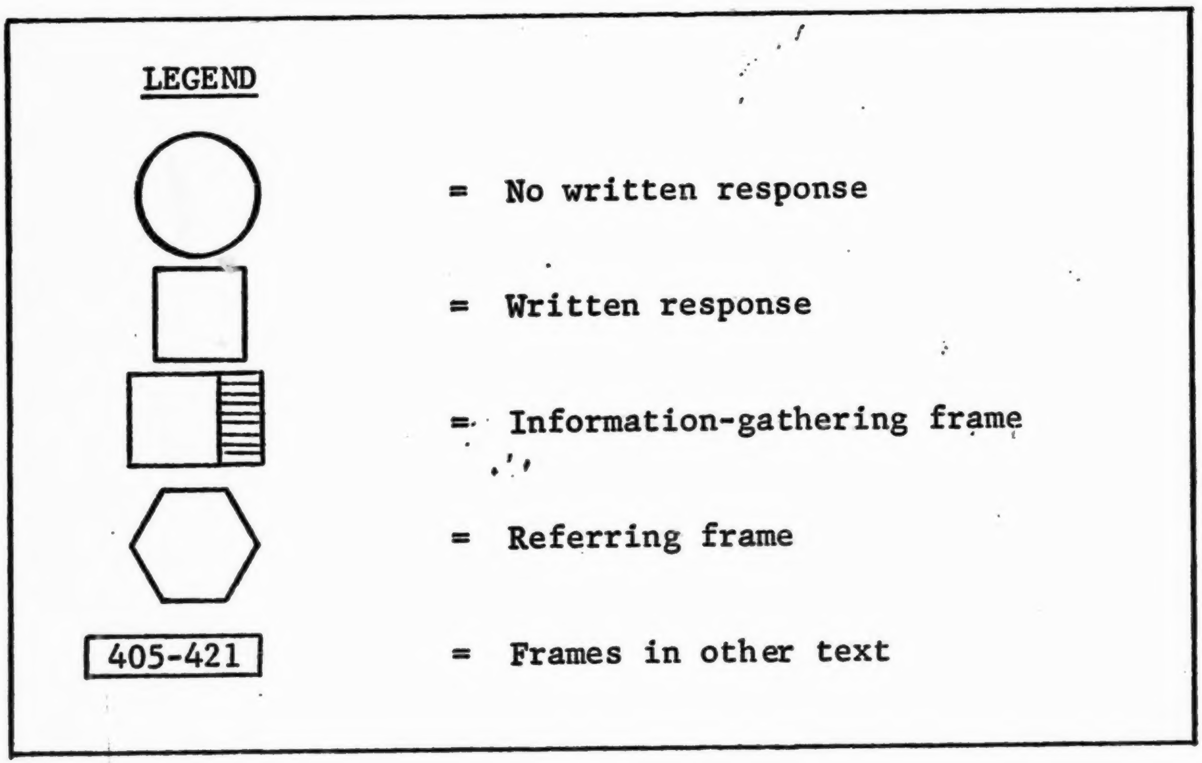
○ = ______________________________

□ = ______________________________

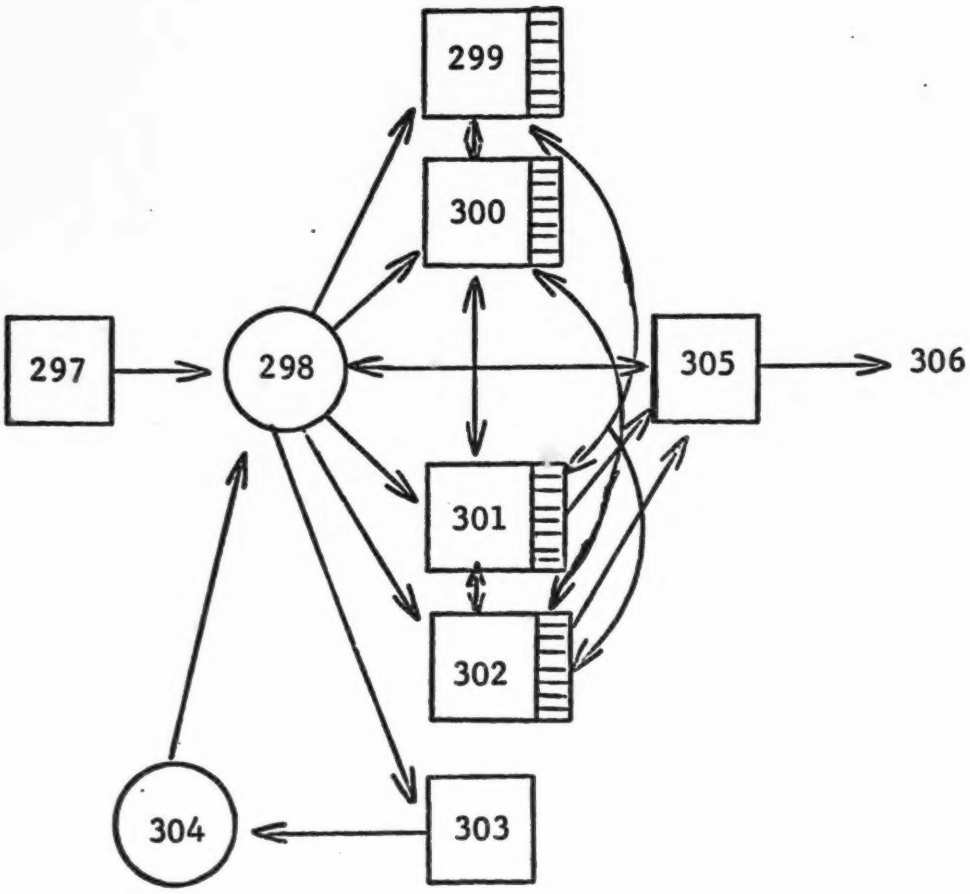
□▤ = ______________________________

⬡ = ______________________________

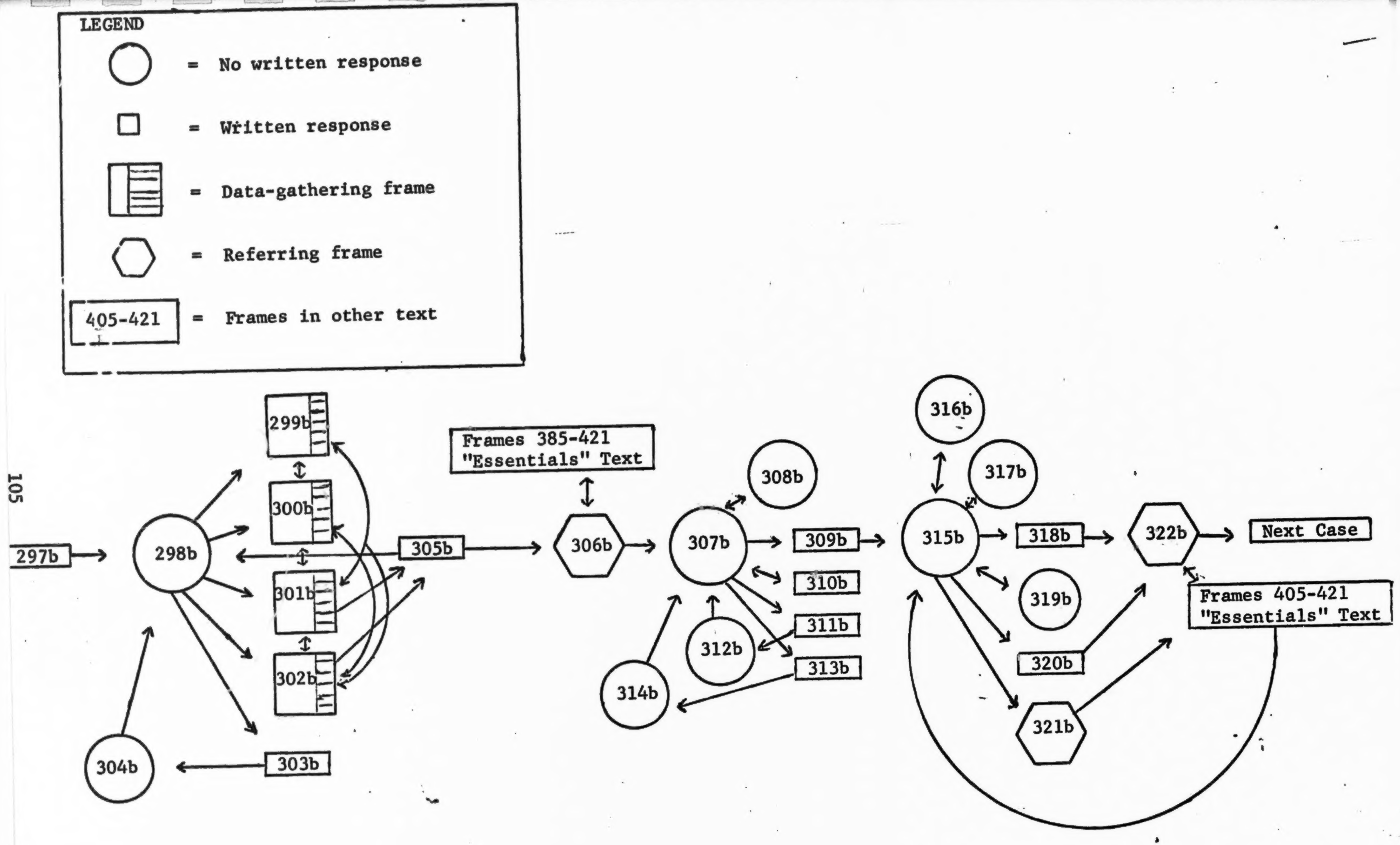
405-421 = ______________________________


LEGEND
= No written response
= Written response
= Information-gathering frame
= Referring frame
405-421
= Frames in other text

Arrows should indicate each direction the student may take in working through the problem. Some arrows will be double-ended. Here are the first few pages of Problem 33, with all the arrows added.


299
300
297
298
305
306
301
302
304
303

A diagram for all of Problem 33 is shown on the following page.


LEGEND
= No written response
= Written response
= Data-gathering frame
= Referring frame
405-421 = Frames in other text
Frames 385-421 "Essentials" Text
Frames 405-421 "Essentials" Text
Next Case

PROBLEM #33

Diagrams such as this are sufficiently unnerving to discourage almost anyone from trying to write programmed case presentations. They are certainly not necessary in the writing of good programmed case materials. All you need is a simple diagram to keep track of the pages. In starting to write programmed cases, however, you are urged not to get involved in attempting to prepare data-gathering pages in your first attempt. You will be more satisfied with your first production if you restrict yourself to the uncomplicated page formats such as were shown in Problem 1. Data-gathering frames, such as are found in most of the remaining cases, are a typographical trick, a means of condensing a large number of random access branching frames into a single page. They are time consuming to prepare, and in the limited time you have available, you may not be able to develop good data-gathering pages and at the same time complete other aspects of your cases to your own satisfaction.

B. MECHANICS OF FRAME WRITING USING FORMATS WITH ALTERNATES

In recent years techniques of writing frames for programmed materials have become much less rigid than they used to be. There was a time when there seemed to be only two irreconcilable techniques, the linear and the branching. These were defended by opposed learning theories which seemed just as irreconcilable as the techniques themselves. Both methods led to the production of some programmed materials which were brilliantly successful, and many others which proved to be wasted effort. In recent years more eclectic approaches to frame writing have become fashionable, and an experienced programmed writer is assumed to be a master of several different techniques and devices, which he should use in a virtuoso fashion, matching his methods to the needs of the moment.

For the student program writer, the need for versatility in using unfamiliar, dissimilar formats is confusing. Because of his inexperience he has a tendency to select one format which seems congenial to him and use it to the exclusion of other formats which at times might be more appropriate to his chosen subject matter and to the objectives for his course. This paper is intended for the student who has actually started to write frames, and who is looking for help in selecting the formats which meet his needs.

Programmed texts can give the appearance of great flexibility and sophistication in the style of writing, using relatively simple means. In case presentation programming, and in the programmed teaching of didactic material, great flexibility can be achieved using a total of five building blocks. These consist of three "question" formats and two "answer" formats.

Here are the question formats:

1. Multiple choice
2. Completion
3. Branching

Here are the answer formats:

1. Linear → next frame
2. Branching (directory) → branches

QUESTION FORMATS

I. The first question format to be discussed is the question requiring a multiple choice response.

The most common adenocarcinoma found in women is cancer of which of these sites?

☐ Brain
☐ Tongue
☐ Lung
☐ Breast
☐ Cervix
☐ Ovary
☐ Skin

(Check your answer, then turn to the next page.)

Figure 1. Multiple choice question

A multiple choice question differs from a completion, "fill-in-the-blank," type question in the help it gives the student. A multiple choice question gives the student a built-in check list. It requires discrimination rather than recall. A multiple choice question can be used most effectively in a programmed text when there is a need for these special characteristics:

1. The student needs help in the form of a check list to answer the question correctly.
2. The emphasis of the question is such that the student's attention should be focused upon discrimination between items, rather than on supplying of information himself.

II. The next question format to consider is the completion format.

> The most common adenocarcinoma found in women
>
> is cancer of the ________________.
>
> (Write your answer, then turn to the next page.)

Figure 2. Completion question

The completion format is most commonly used in conventional linear programs designed to teach didactic material. When it is used appropriately, it usually has these characteristics:

1. It should require the student to supply critical information.
2. It should have a high probability of being completed correctly.
3. It requires previous preparation or prompting.
4. The prompting should precede the required response.

The sample question meets all the criteria for a typical constructed response question. It is a "test" question, however, rather than a "teaching" question because the student must depend upon previous information to answer the question correctly. It contains no prompts to help the unprepared student come up with the right answer.

What is a prompt? Here are samples taken from a programmed text called "What is a Macadamia?" (1)

1. Pecans, cashews, almonds, and macadamias are all ________________.

2. Because macadamias are eaten mostly by hula girls, surf boarders and beachcombers, we can guess that they are grown in ________________.

3. You have now learned that macadamias are ____________ that are grown in ______________________.

Figure 3. Frames from "What is a Macadamia?"

These three frames illustrate thematic prompting. There are other methods of prompting or cueing the student to come up with the right answer, but for most adults thematic prompting is the least irritating.

As an illustration of thematic prompting in eliciting a correct response to the sample question, "The most common adenocarcinoma in women is...etc.", here is a not-very-inspired effort:

> In self examination for cancer, women with spectacular figures may be at a disadvantage as compared with less bosomy types. The most common adenocarcinoma in women--often first noticed by the patient herself as a small lump--is cancer of the ____________.

Figure 4. Sample of Thematic Prompting

III. The third question format is branching. It is simply a combination of a multiple choice question with a directory.

The most common adenocarcinoma found in women is cancer of which of these sites?

☐ Brain, page 3
☐ Tongue, page 4
☐ Lung, page 5
☐ Breast, page 6
☐ Cervix, page 7
☐ Ovary, page 8
☐ Skin, page 9
☐ None of the above, page 10

(Check your answer and turn to the page indicated.)

Figure 5. Branching question

Characteristics of a question in this format are these:

1. It encourages debate and digression, and sets up a kind of Socratic dialogue between the student and the text.
2. It limits debate to the options given in the question.
3. It often blunts the student's incentive to select the right answer on his first try.
4. It is particularly effective as a method of eliciting the student's opinion.

The sample branching question, as given, is probably inappropriate for a group of previously prepared learners who would be expected to recognize or recall the correct answer without much effort. For such a group, branches add little to the text except bulk and inconvenience.

If the question is changed to a highly debatable one, however, the appropriateness of the question format may change accordingly. Here is a new question prepared in three question formats:

The cancer which women fear most is cancer of the ____________________.

(Write your answer, then turn to the next page.)

Figure 6. Completion question

The cancer which women fear most is cancer of which one of these?

☐ Brain

☐ Tongue

☐ Lung

☐ Breast

☐ Cervix

☐ Ovary

☐ Skin

(Check your answer, then turn to the next page.)

Figure 7. Multiple choice question

The cancer which women fear most is cancer of which one of these?

- ☐ Brain, page 3
- ☐ Tongue, page 4
- ☐ Lung, page 5
- ☐ Breast, page 6
- ☐ Cervix, page 7
- ☐ Ovary, page 8
- ☐ Skin, page 9
- ☐ None of the above, page 10

(Check your answer, then turn to the page indicated.)

Figure 8. Branching question

One may assume that the learner will recognize that his answer to this question (in all of the formats) is a matter of personal opinion rather than scientific fact. He can express his opinion in any of the three formats, but only the branching format permits his opinion to differ from that of the programmer and still be accepted by the program.

ANSWER FORMATS

IV. Flexibility in programming can be achieved by combining the three question formats with two answer formats, *linear* and *branching*. Here is a sample linear answer to the question "The most common adenocarcinoma found in women is...etc."

BREAST

(Skin cancers are more common, but they usually derive from squamous rather than glandular elements, and hence are not adenocarcinoma.)

(Next frame)

The importance of early detection, etc....

Figure 9. Linear answer (in capitals)

The linear confirmation or answer has these characteristics:

1. It prevents digression and defers debate.
2. It leads directly to the next question frame.

It should be assumed that answers in this format often go unread. The student who is confident that he is correct will often proceed to the next question frame without so much as a glance at the confirming words in the answer. On the other hand, the student who is less confident of his own response usually checks it against the confirmation in the answer frame before proceeding to the next question. Additional secondary information, shown in parentheses in the sample, is likely to be read only by the student who is unsure of his answer or who has made an error. In general, linear answers rely on the erring student's initiative and ingenuity to discover the nature of his errors. They supply the correct answer, but do not help the student diagnose his own deficiencies.

V. The other type of confirmation or answer frame is the branching.

> From the list below, select the response which most nearly corresponds to your own, then turn to the page indicated.
>
> ☐ Brain, page 3
> ☐ Tongue, page 4
> ☐ Lung, page 5
> ☐ Breast, page 6
> ☐ Cervix, page 7
> ☐ Ovary, page 8
> ☐ Skin, page 9
> ☐ None of the above, page 10

Figure 10. Branching answer

This answer format has two important characteristics:

1. It provides for digression and debate.
2. It interposes an additional step between the student's response and his confirmation, feedback, or remedial instruction.

This format should be used only when the need to give the student an opportunity for digression and debate is sufficient to justify the delay caused by the additional step. Furthermore, a branching answer is appropriate only when it follows a completion-type question. A multiple choice question leading to a branching answer would be an obvious redundancy, involving unnecessary busy-work for the student.

It should be replaced by a branching question, which combines the question and the directory on one page. Branching questions and branching answers can lead to subsequent frames in any format.

VI. Coded Multiple Choice pages can be prepared in a variety of formats, depending on how many items are indicated and how much commentary is desired on each item. Such pages should be looked on as devices for presenting many branching frames on a single page, eliminating unnecessary page-turning, and reducing the bulk and inconvenience of the text. The programming principles for preparing a page with many frames on it are the same as for preparing the same frames on separate pages.

FINDINGS

1.	None felt	(I)
2.	Abnormality found, see other items	(I)
3.	Unobstructed	(R)
4.	Not felt	(R)
5.	Old mastectomy scar on left, right negative. No nodes	(I)
6.	Obstructed	(S)
7.	DTR's physiologic	(R)
8.	Well developed, mod. obese, W.F.	(R)
9.	2 cm ulcer on right lateral wall (lower third)	(I)
10.	No abnormalities noted	(R)
11.	37°, 80, 24, 110/80	(S)
12.	Atrophic	(I)
13.	Well-formed	(R)
14.	Moist	(R)
15.	Midline	(R)
16.	Atrophic	(R)
17.	Obese	(I)
18.	Undistended	(R)
19.	No abnormalities noted	(I)
20.	Grade II changes, capillary microaneurisms	(R)
21.	Not noted	(R)
22.	37°, 80, 18	(R)
23.	Sounds normal	(S)
24.	5'6", 170 lbs., 180/112	(R)
25.	All present and equal	(R)
26.	Not enlarged	(I)
27.	Intact	(R)
28.	Unremarkable (R)	(I)
29.	Supple	(R)
30.	Left drum perforated	(R)

GENERAL PHYSICAL EXAMINATION

Please check the parts below which interest you, then look up the results with the corresponding code number in the column on the left.

General description	8	( )
TPR	22	( )
BP, hgt., wgt.,	24	( )
Skin	14	( )
Lymph nodes	26	( )
Head and face	13	( )
Ears	30	( )
Eyes	20	( )
Nose	3	( )
Mouth and throat	28	( )
Neck	29	( )
Thyroid	4	( )
Trachea	15	( )
Vessels	18	( )
Chest	28	( )
Breasts and axillae	5	( )
Heart	28	( )
Lungs	19	( )
Abdomen	17	( )
LSK	4	( )
Masses	21	( )
Tenderness	10	( )
Pelvic examination	2	( )
Ext. genitalia	16	( )
SUB glands	4	( )
Vagina	9	( )
Cervix	12	( )
Uterus	19	( )
Adnexa	26	( )
Rectal	10	( )
Sphincter	27	( )
Masses	1	( )
Extremities	13	( )
Pulses	25	( )
Reflexes	7	( )
Neurological	10	( )

CODE

I= INDICATED, required by presenting problem.
R= ROUTINE, for screening or completeness of evaluation.
U= Probably USELESS but harmless in this case.
C= CONTRAINDICATED, not in patient's interest.
S= SPURIOUS, bogus answer.

DIRECTORY (your next step)

Diagnostic studies, page 281b
History, page 279b
Your diagnostic opinion, page 284b
Your plan of therapy, page 286b

Figure 11. Coded Multiple Choice Page

Of the following items, only the ones which correspond to the code numbers on the right apply to this particular patient.

1. You are needlessly subjecting this girl to the effects of a dangerous drug.
2. Often give some degree of temporary improvement.
3. Contraindicated, since antihistamines are strong sensitizers when used topically. Plain calamine lotion may be effective for the itching.
4. Useful since acute weeping stage has passed. Tars are keratolytic, antipruritic. Disadvantages: they stain, are photosensitizing and may promote sterile furunculosis.
5. Rarely indicated because strong sensitizers when used topically.
6. Suggest trial period 10-12 days off wheat to determine if allergen since it is very difficult to avoid wheat. History indicates only tomatoes known to aggravate her eczema.
7. Unlikely the answer since she shows no evidence of severe emotional problem.
8. Good idea if parents can afford, as history indicates they can. Air conditioners filter some pollen and dust. Would diminish sweating which aggravates itching.
9. Nonsense.
10. Prove it is etiologically responsible, then recommend avoiding it. Remove for two weeks, then challenge.
11. Good! This alone may cause significant improvements in skin and nose.
12. Probably good.
13. Probably a good idea. These foods are relatively easy to avoid and are known potent sensitizers.
14. This may not be easy and may not result in immediate improvement due to danders left in rugs, bedding, etc., but they should at least be kept outside.
15. For seasonal allergic rhinitis, this may be only therapy indicated, if one can be selected with no side effects (often by trial and error). For year round allergic rhinitis and chronic recurrent skin allergy as exhibited by patient these have proved disappointing.
16. Go to page 62.
17. Go to page 63.
18. Go to page 64.
19. May give temporary relief but not recommended for continued regular use because of the rebound phenomenon and hypertrophy of mucosa which may result.

START HERE !

Check the items below which you think are appropriate. Then refer to the corresponding code number in the column on the left for information.

___Stop eating wheat in any form......................6

___See a psychiatrist........7

___Avoid chocolate, nuts and fish.................13

___Antihistamine p.o. PRN...15

___Caladryl lotion (Benadryl plus calamine)............3

___Talk with mother.........17

___Prednisone 40 mgm p.o. & taper off in 5 days.......1

___Hyposensitization........16

___Nasal spray or nose drops...................19

___Coal tar ointment.........4

___Benzocaine (anesthetic) ointment..................5

___Get rid of cat & dog.....14

___Get an air conditioner for bedroom...............8
___Stop drinking milk.......10
___Don't play basketball or other strenuous exercise..9
___Pay more attention to cleaning bedroom & move any expendable furniture to other rooms...........11
___Sudafed (pseudoephedrine) p.o. PRN for nasal stuffiness...............12
___Discourage cigarette smoking.................18
___Topical steroid...........2

Directory:
After completing your Management, go to page 65 for Summary of Case.

Figure 12. Coded Multiple Choice Page

SUMMARY

QUESTION FORMATS   CONFIRMATION FORMATS   SUCCEEDED BY

1. Multiple Choice
   - a. Gives the student an immediate prompt in the form of a check list.
   - b. Is best used to focus on fine discriminations rather than to require recognition of the obvious.

Linear confirmation prevents digression and defers debate. → Next Frame

2. Completion
   - a. Should call for critical information
   - b. Should usually be completed correctly.
   - c. Requires prompting or previous preparation.

Branching confirmation encourages digression and debate. → Branches

3. Branching → Branches, Branches, Branches
   - a. Combines a multiple choice question with a branching directory on one page.
   - b. Is most useful in eliciting opinion and involvement on debatable or controversial issues.
   - c. Often weakens the student's resolve to try for the best answer.

4. Coded Multiple Choice Page → Directory
   - a. Combines a large number of questions, confirmations, and commentaries on one page.
   - b. Requires the same programming strategies as for questions and confirmations on separate pages.
   - c. Eliminates unnecessary page turning but preserves advantages of branching.

CONCLUSION

Great flexibility can be achieved in writing programmed texts by using various combinations of five basic units. These consist of three "question" formats and two "confirmation" formats. The choice of a particular format to meet a given learning situation should be related to the outcome desired by the programmer, and is governed by rather simple rules.

REFERENCES

1. Jones, Pat. "What is a Macadamia?" Programmed Instruction Department, United Services Automobile Association, San Antonio, Texas: 1963. (22 pages)

C. PARTICIPATION BY STUDENTS IN DEVELOPING PROGRAMMED INSTRUCTION

Murray Freedman, M.D. and Sandra Freedman, M.D.

SUGGESTIONS FOR PROGRAMMING

A. Who Can Learn to Program?

1. Anyone can learn.
2. Students, interns and residents can learn.
    - i. They must first gather and learn the information that is to be programmed.
    - ii. They must have cooperation and supervision from the supporting faculty member.
    - iii. Programming is beneficial to the student because he thoroughly learns the material he is programming.
    - iv. Students can be attracted to programming who have a special interest in the subject to be programmed.

B. How Can One Learn to Program?

1. No formal instruction is needed.
2. One can learn by reading a variety of programmed materials to determine:
    - i. the types of frames he likes, and
    - ii. the types of frames he dislikes.

C. What Can Be Programmed?

1. Any material can be programmed.
2. Some subjects may be better taught by programming. Example: Example: Steroids

D. Determine the Groups for Whom You Are Programming.

1. The prerequisites of your audience will determine what you will program and how you will program it.
2. Their critiques are your "checks and balances."

E. Know the Scope and Limitations.

1. Define your goals (scope).
    - i. Know the material you want to teach.
    - ii. Know the depth to which you want to go.
    - iii. Outline your progression with a definite endpoint in mind.
2. Know the limitations.
    - i. Know the limitations of your audience.
    - ii. Know the limitations of programming itself.
        - a. Frames must teach and be rewarding.
        - b. Frames must avoid frustrations. (Avoid asking for a response which has not yet been taught.)

F. How Should Programmed Material Be Evaluated?

1. The material should be evaluated as to content and corrections--best done by the supervising faculty member or others knowledgable in the field.
2. The materials should be evaluated as to whether it will teach--best done by the audience for which it was written.